



Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

User Ortho

Välj överarmsbenet  
och rotera det.

Underarmsbenet  
följer med  
i överarmsbenets  
rorelser

Det här kallas  
Forward kinematics.

(1) Armature armup.L

Poly

Frace

Operator



View

Select

Pose

Pose Mode



Global

Pass Index: 0

Groups

Add to Group

Start: 1

End: 250

View Search All Scenes

World



Armature

Armature

Transform

Location:	Rotation:	Scale:
< 0.000 >	< 0° >	< 1.000 >
< 0.000 >	< 0° >	< 1.000 >
< 2.953 >	< 0° >	< 1.000 >

Rotation M XYZ Euler

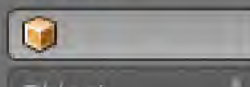
Delta Transform

Transform Locks

Relations

Layers:

Parent:



Object





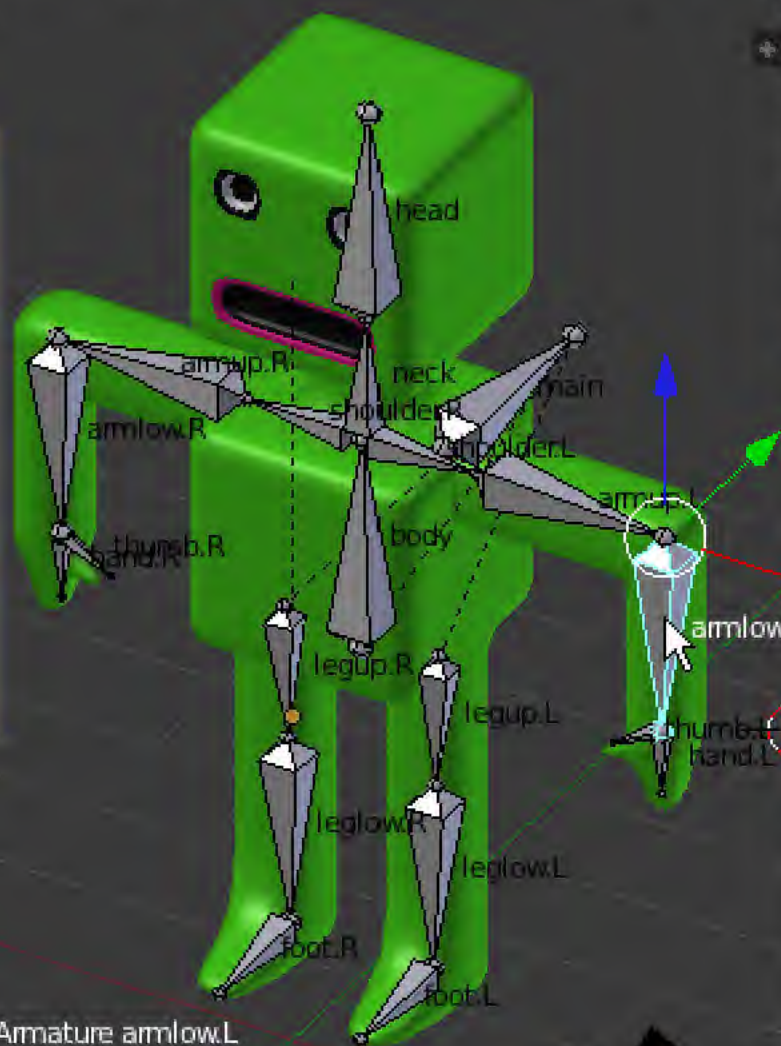
Scale

User Ortho

In-Between:

Om man istället vill kunna  
få överarmsbenet  
att följa underarmsbebenes  
rörelser  
så måste man skapa  
Inverse kinematics.

Börja med att markera  
underarmsbenet.



(1) Armature amlow.L

Grease Pencil:

Draw Line

Poly Erase

▼ Operator

View Select Pose Pose Mode Global

View Search All Scenes

World

Armature

Armature

▼ Transform

Location:	Rotation:	Scale:
< 0.000 >	< 0° >	< 1.000 >
< 0.000 >	< 0° >	< 1.000 >
< 2.953 >	< 0° >	< 1.000 >

Rotation M XYZ Euler

► Delta Transform

► Transform Locks

▼ Relations

Layers: Parent:

Object

Pass Index: 0

▼ Groups

Add to Group

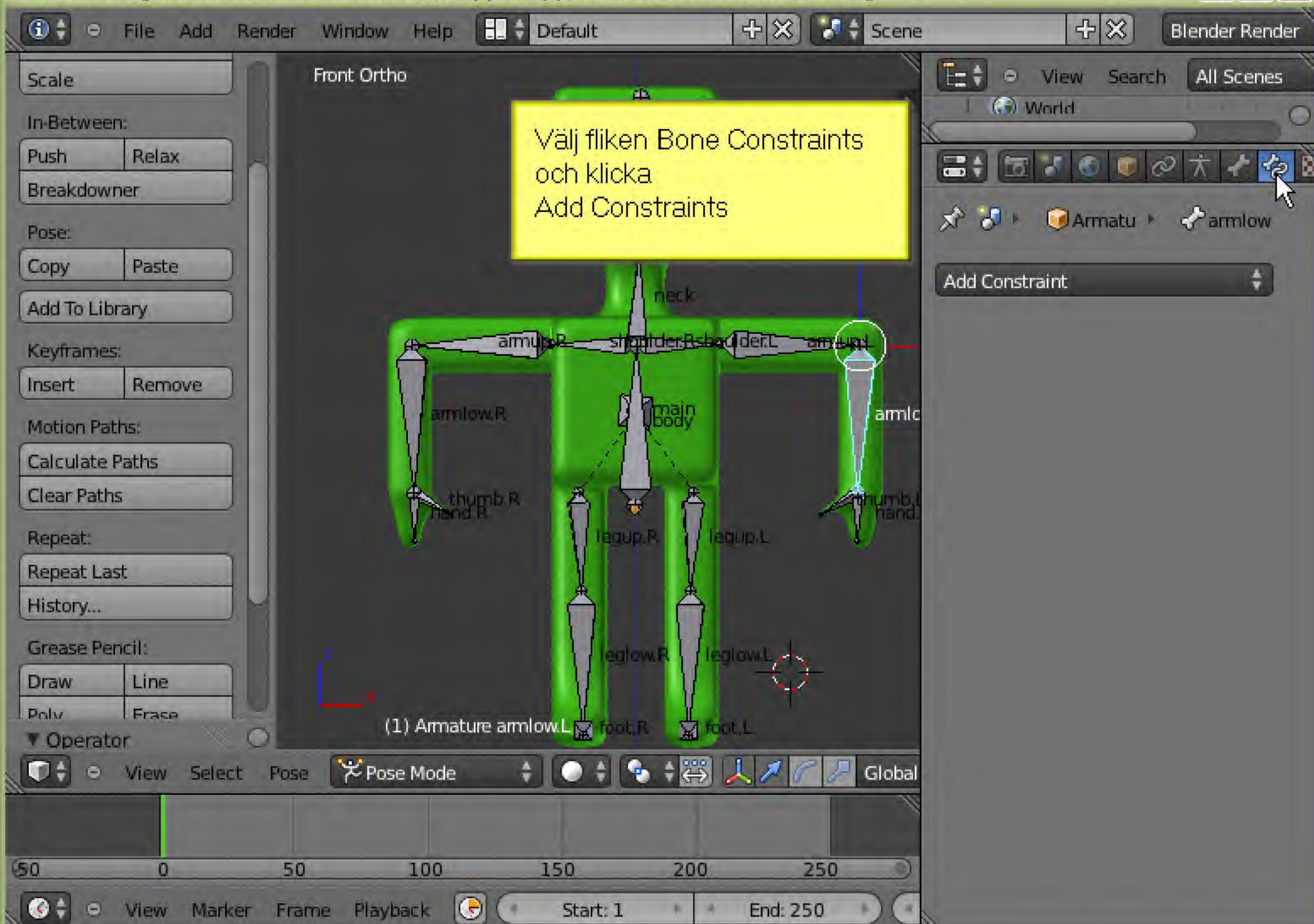
+

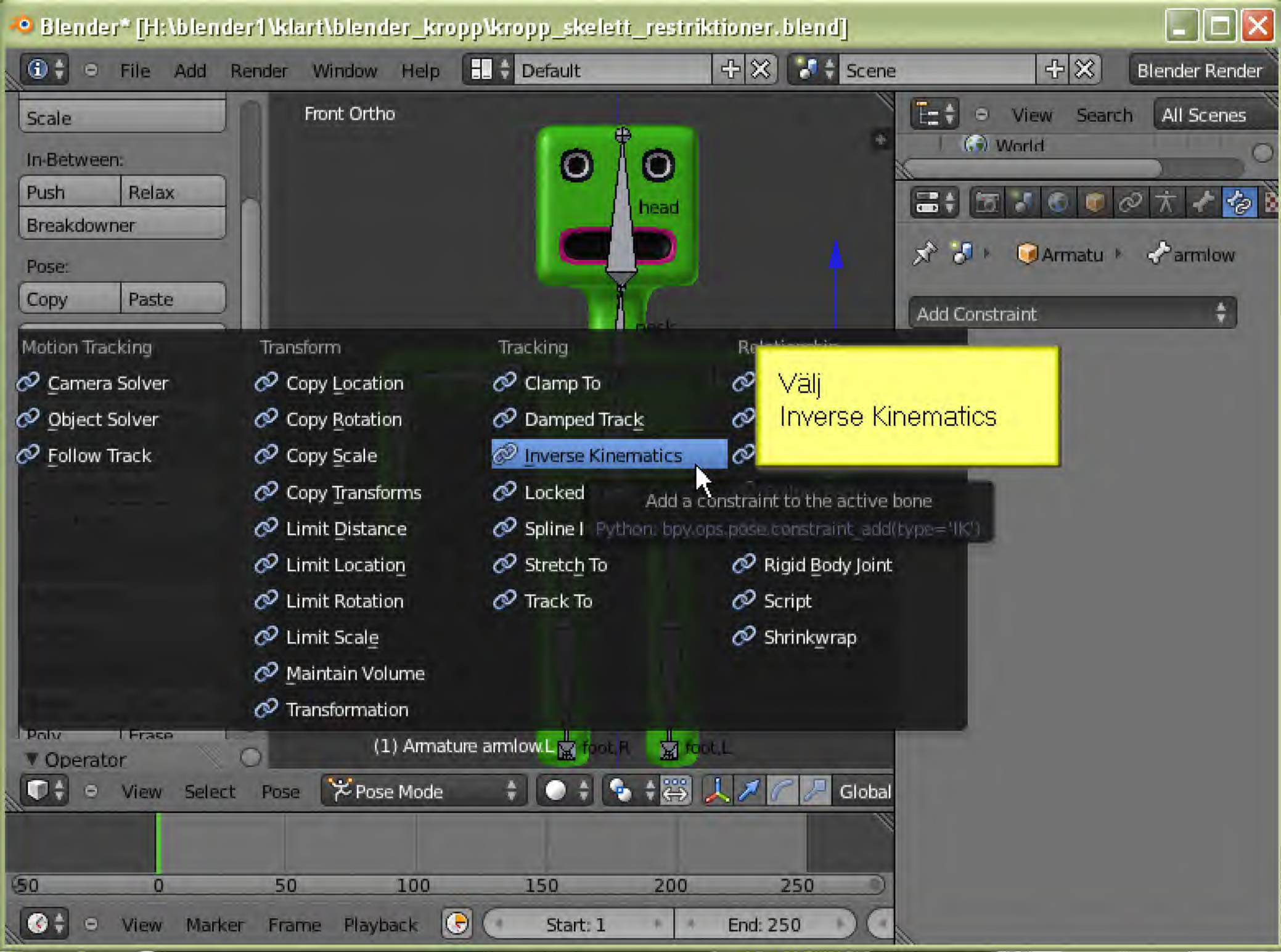
View Marker Frame Playback

Start: 1

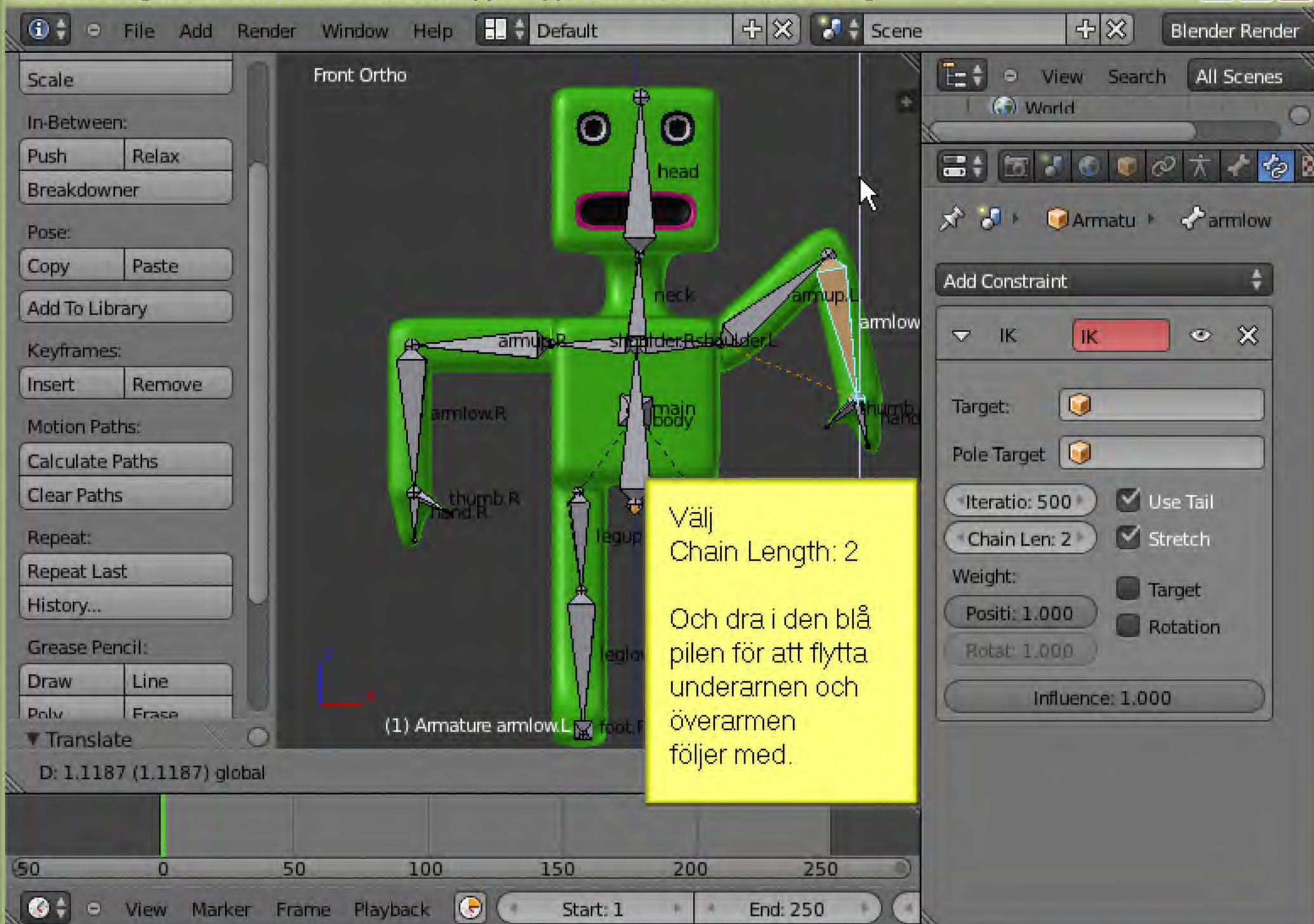
End: 250



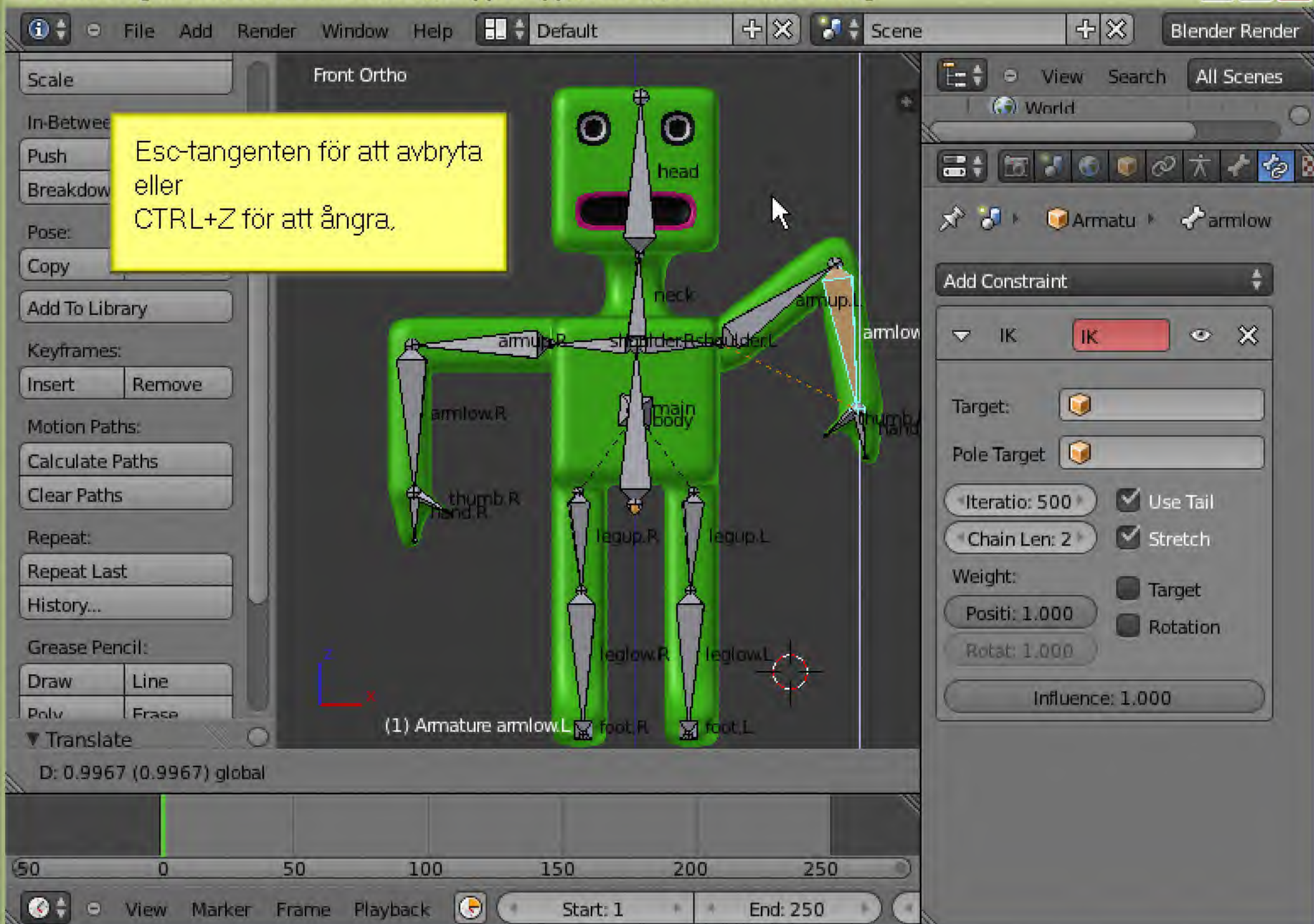




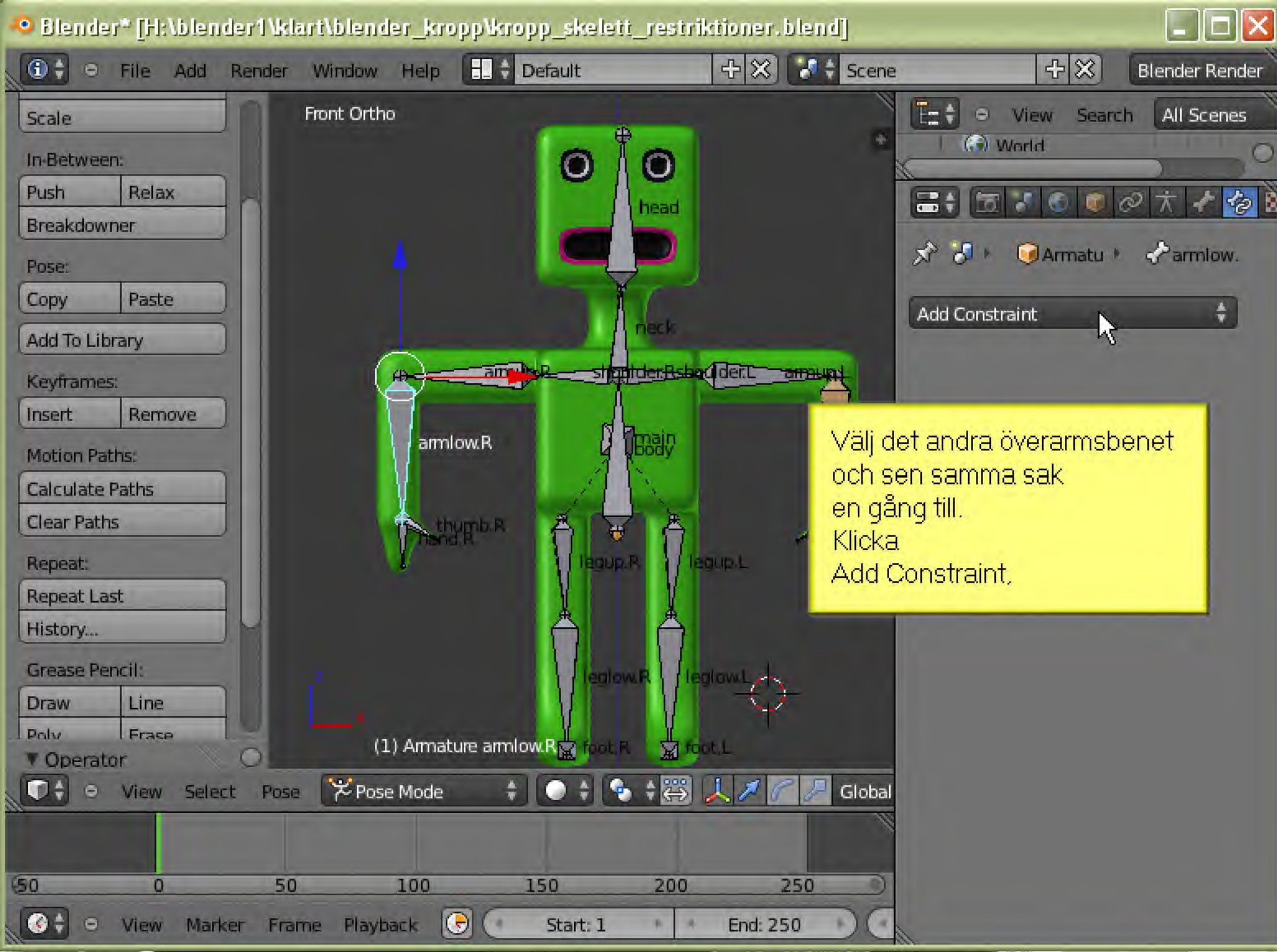




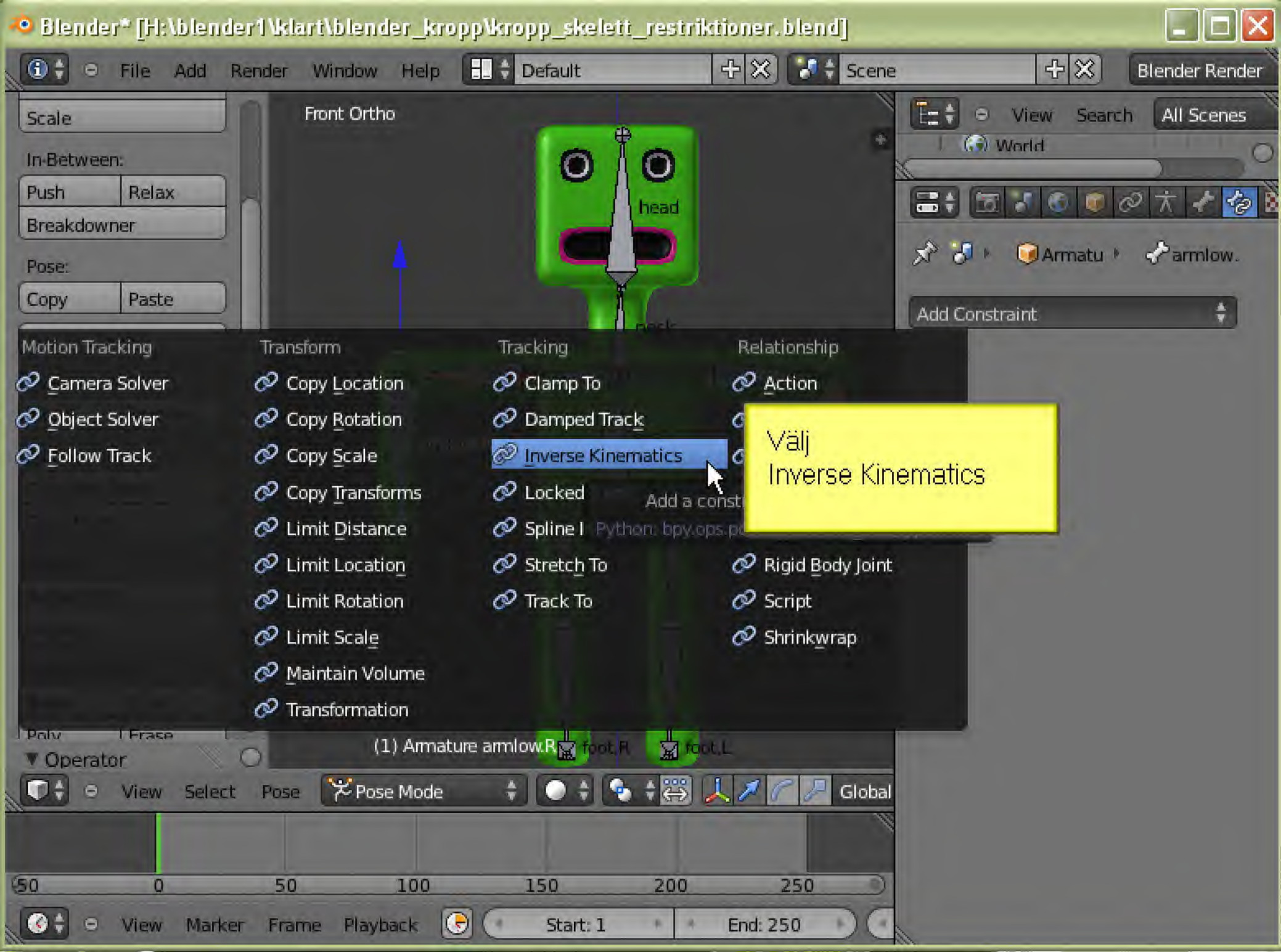




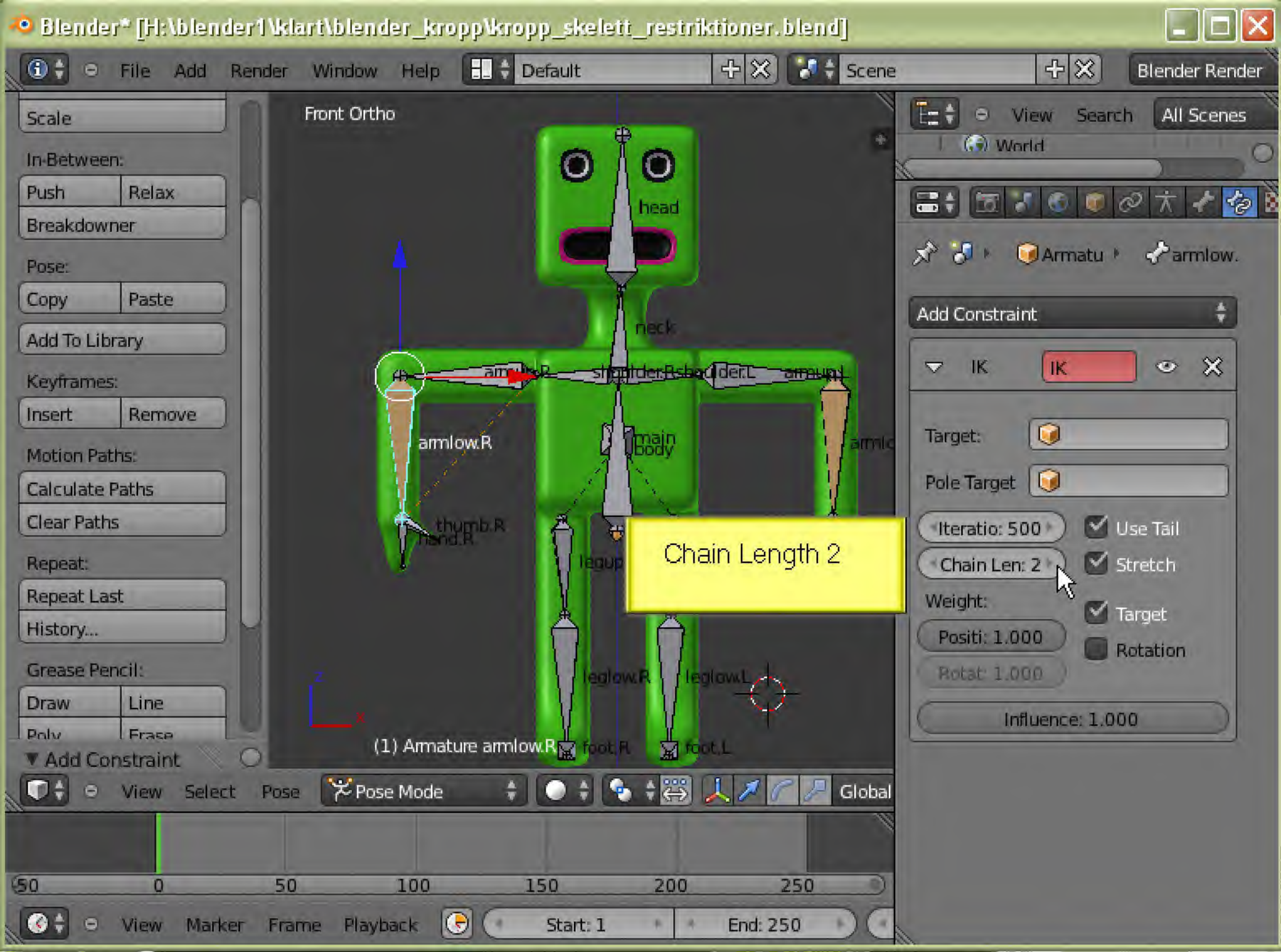












Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

Add To Library

Keyframes:

Insert

Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Poly

Fraser

Add Constraint

View Select Pose Pose Mode

Global

Front Ortho

Chain Length 2

View Search All Scenes

World

Armature armlow.

Add Constraint

IK IK

Target:

Pole Target

Iteration: 500 Use Tail

Chain Len: 2 Stretch

Weight: Target

Positi: 1.000 Rotation

Rotat: 1.000

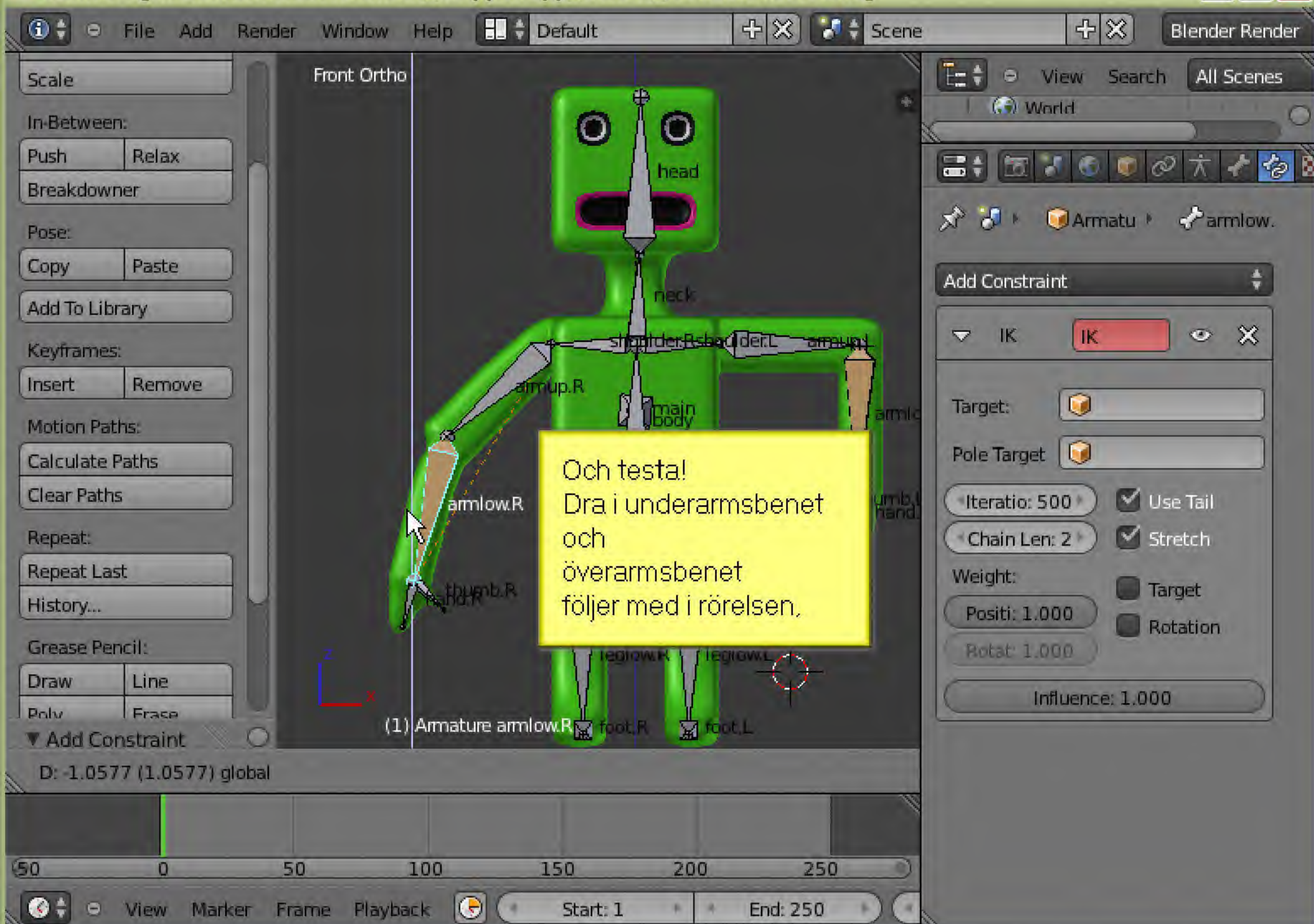
Influence: 1.000

(1) Armature amlow.R foot.R foot.L

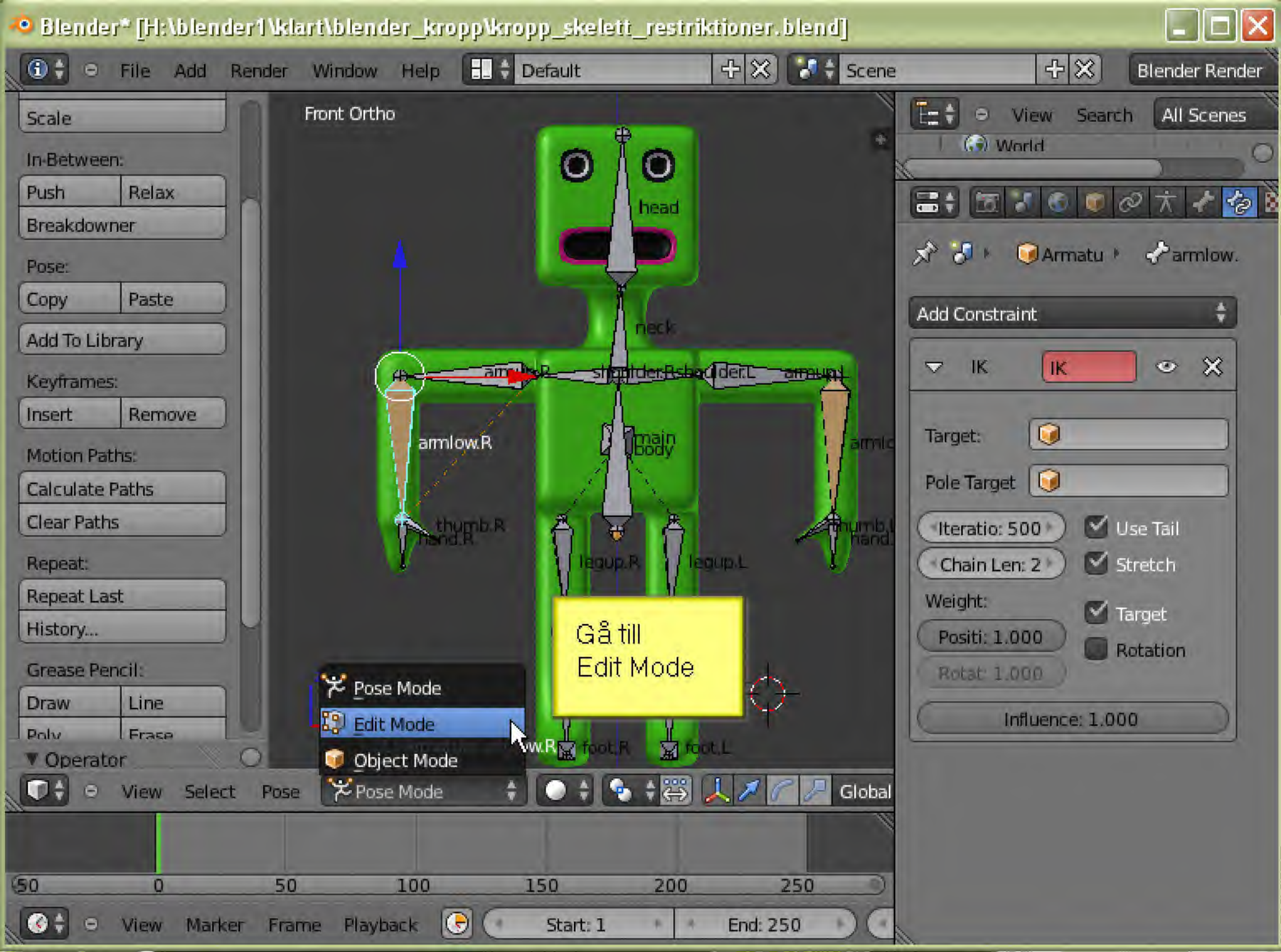
Start: 1

End: 250

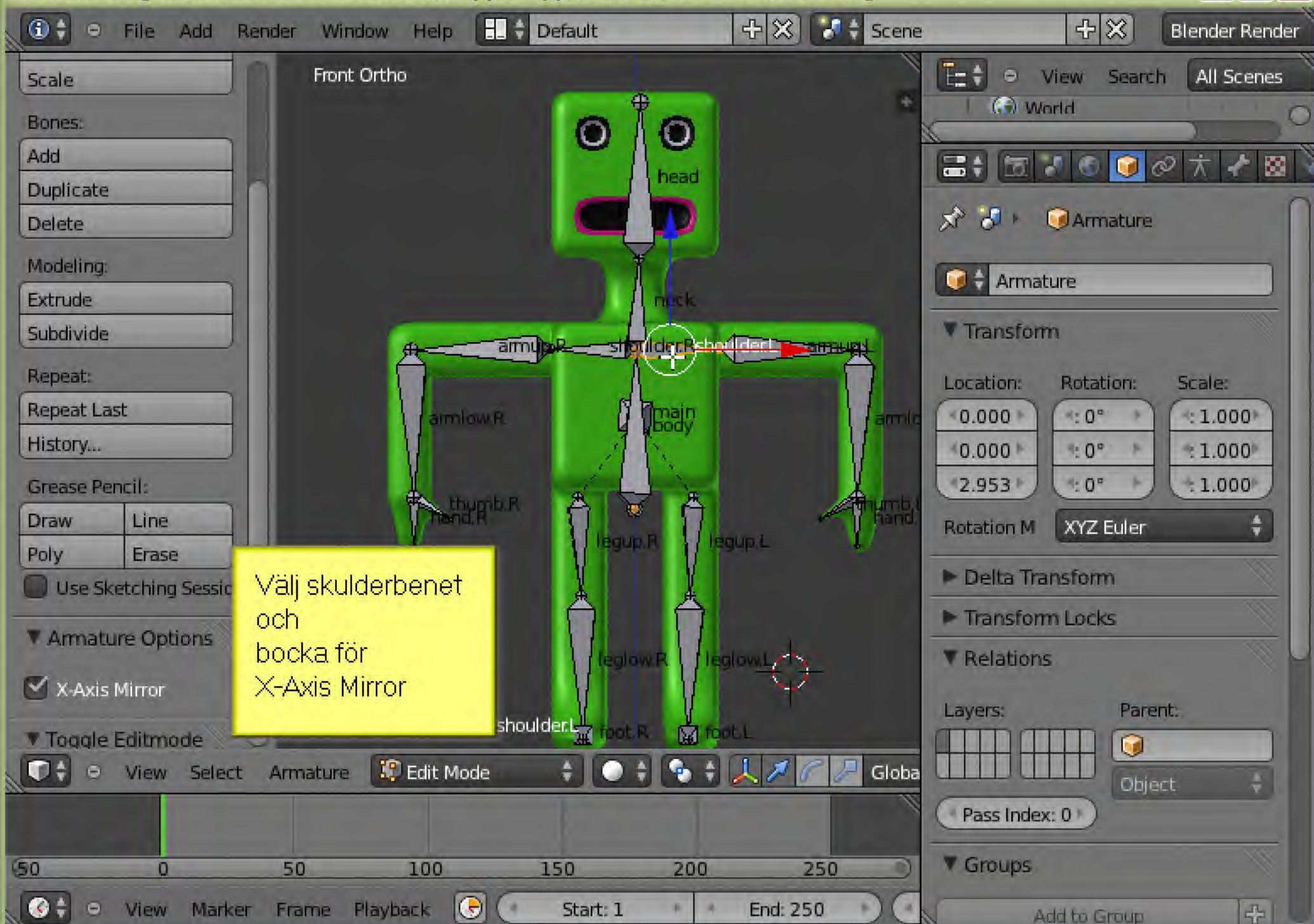








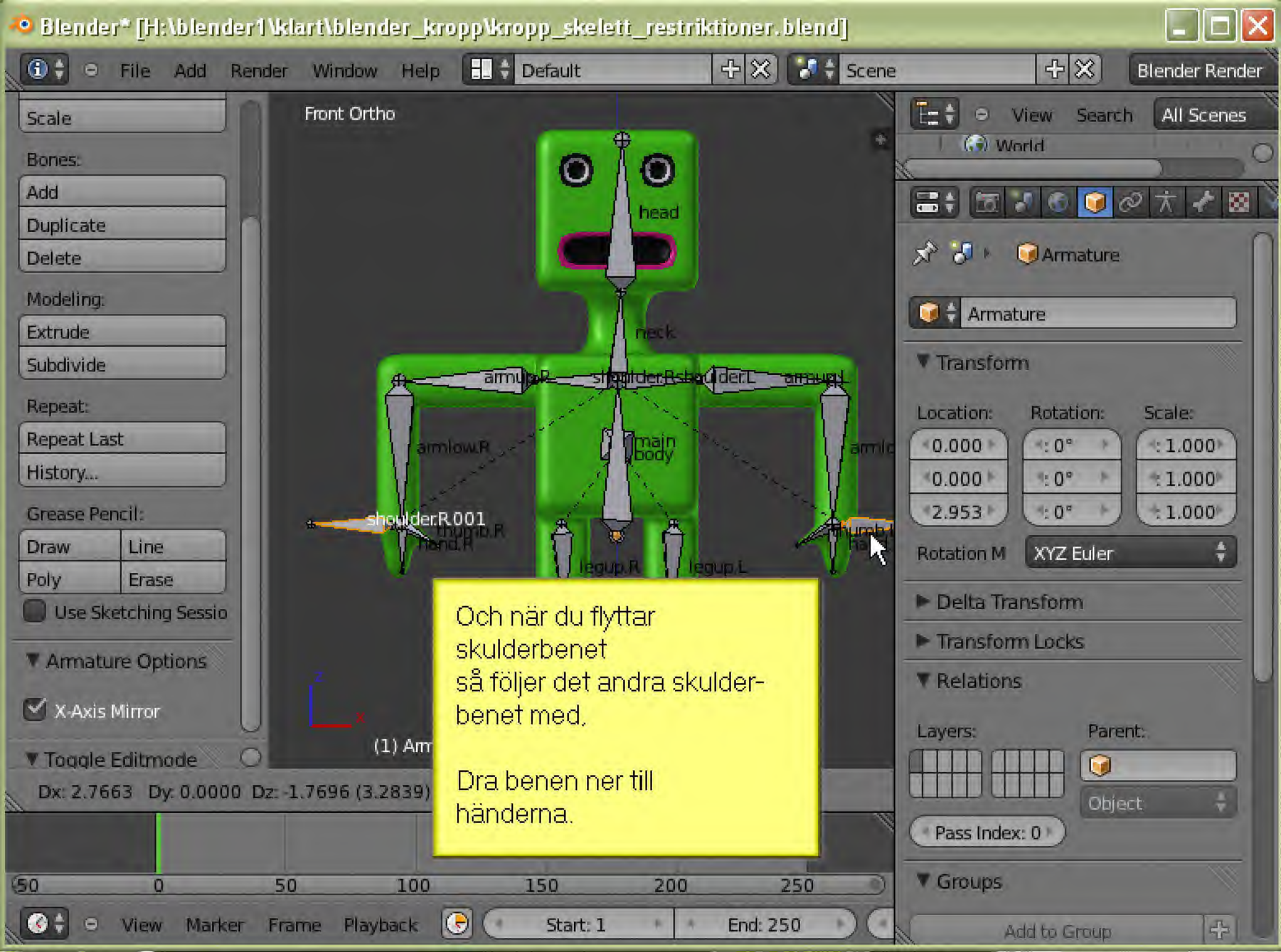








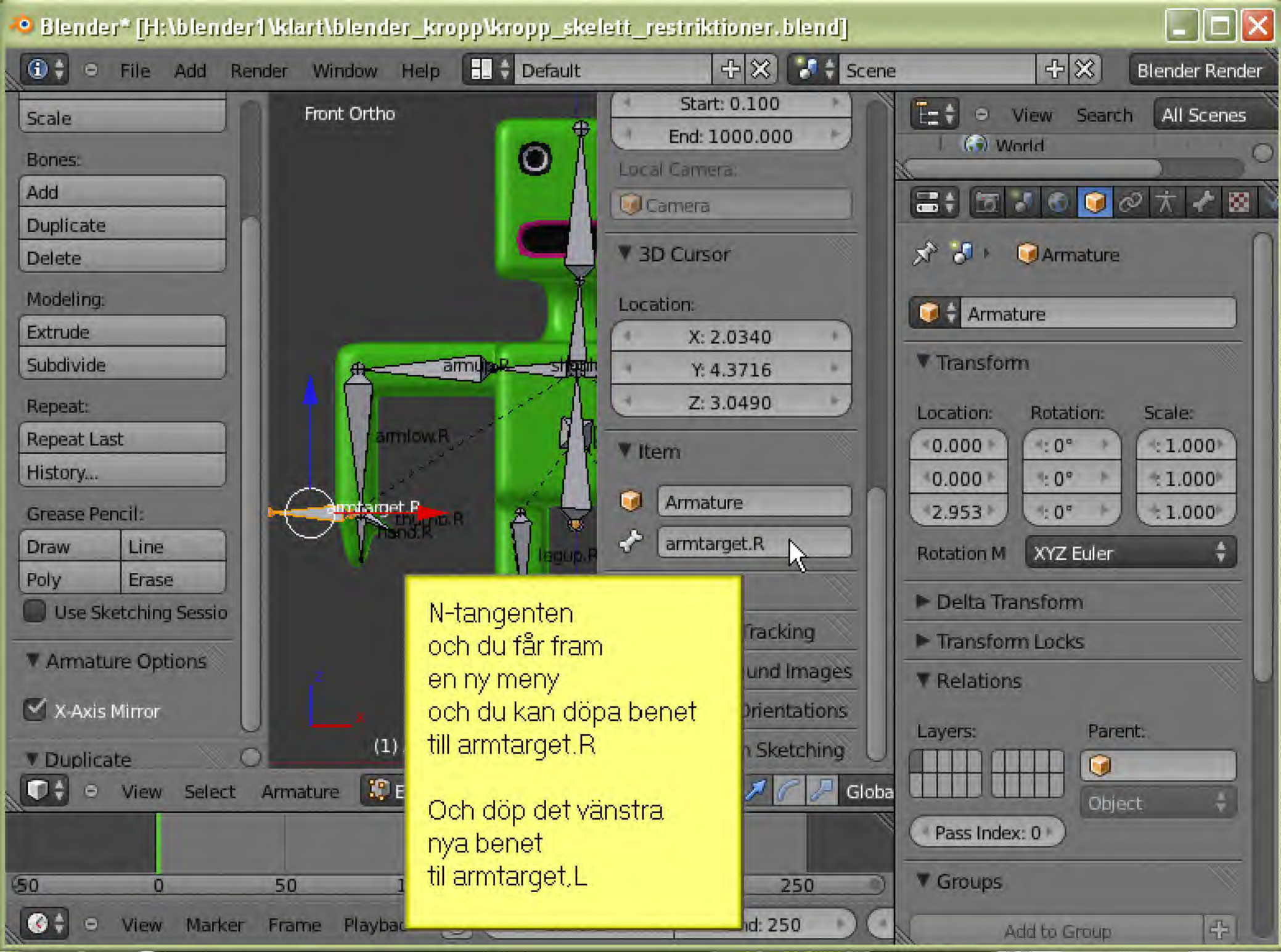




Och när du flyttar  
skulderbenet  
så följer det andra skulder-  
benet med.

Dra benen ner till  
händerna.

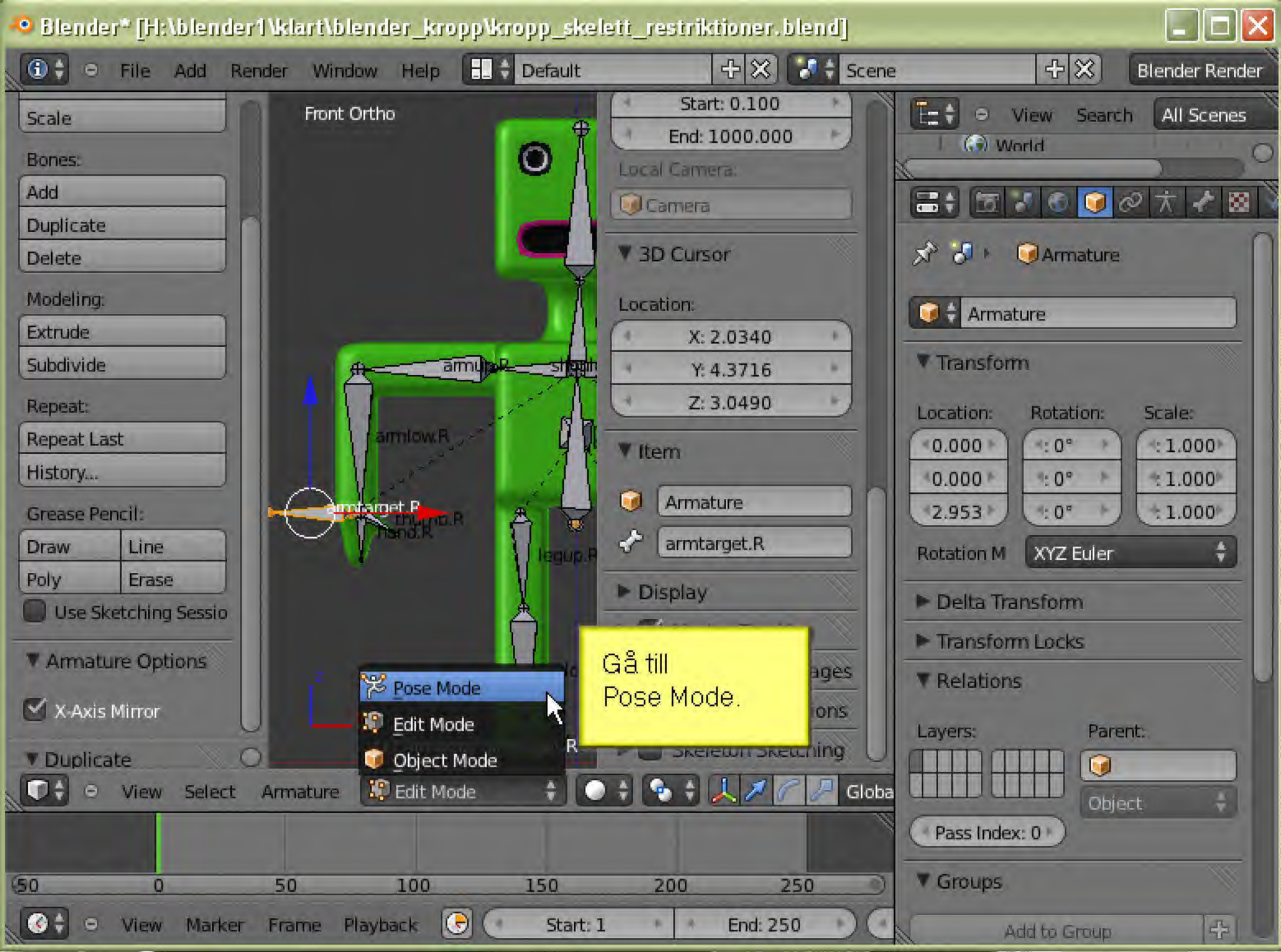




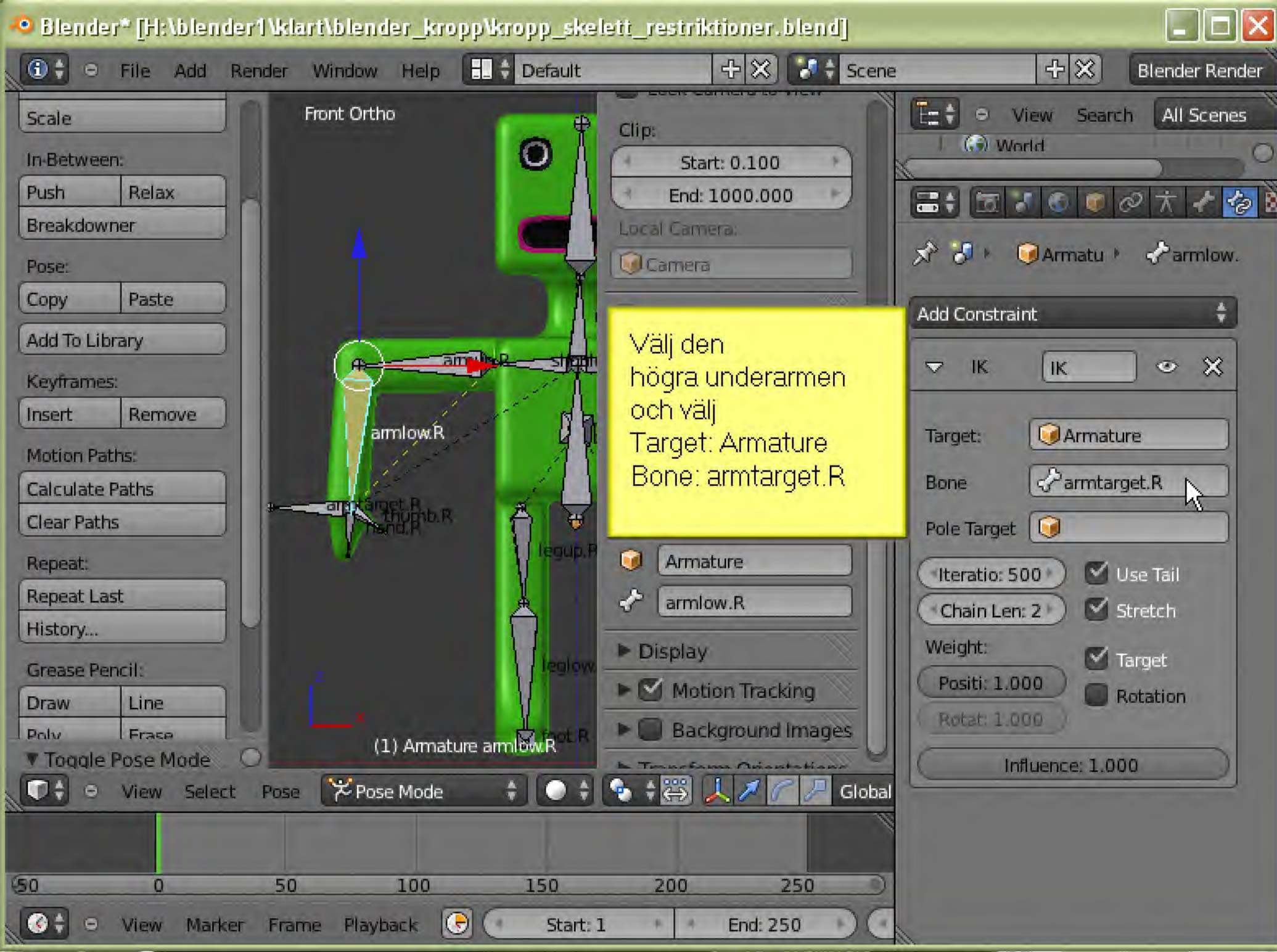
N-tangenten  
och du får fram  
en ny meny  
och du kan döpa benet  
till armtarget.R

Och döp det vänstra  
nya benet  
til armtarget.L





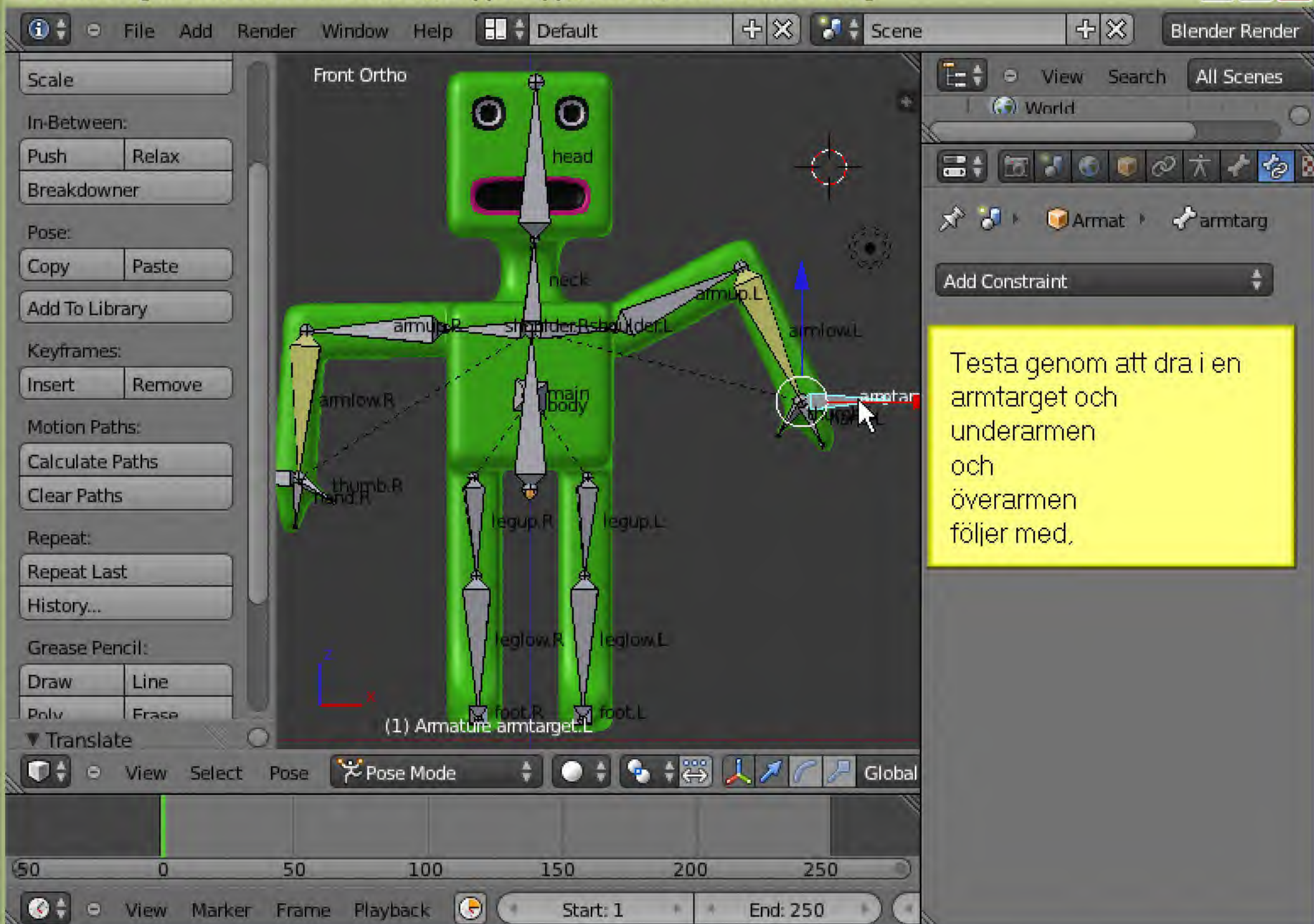




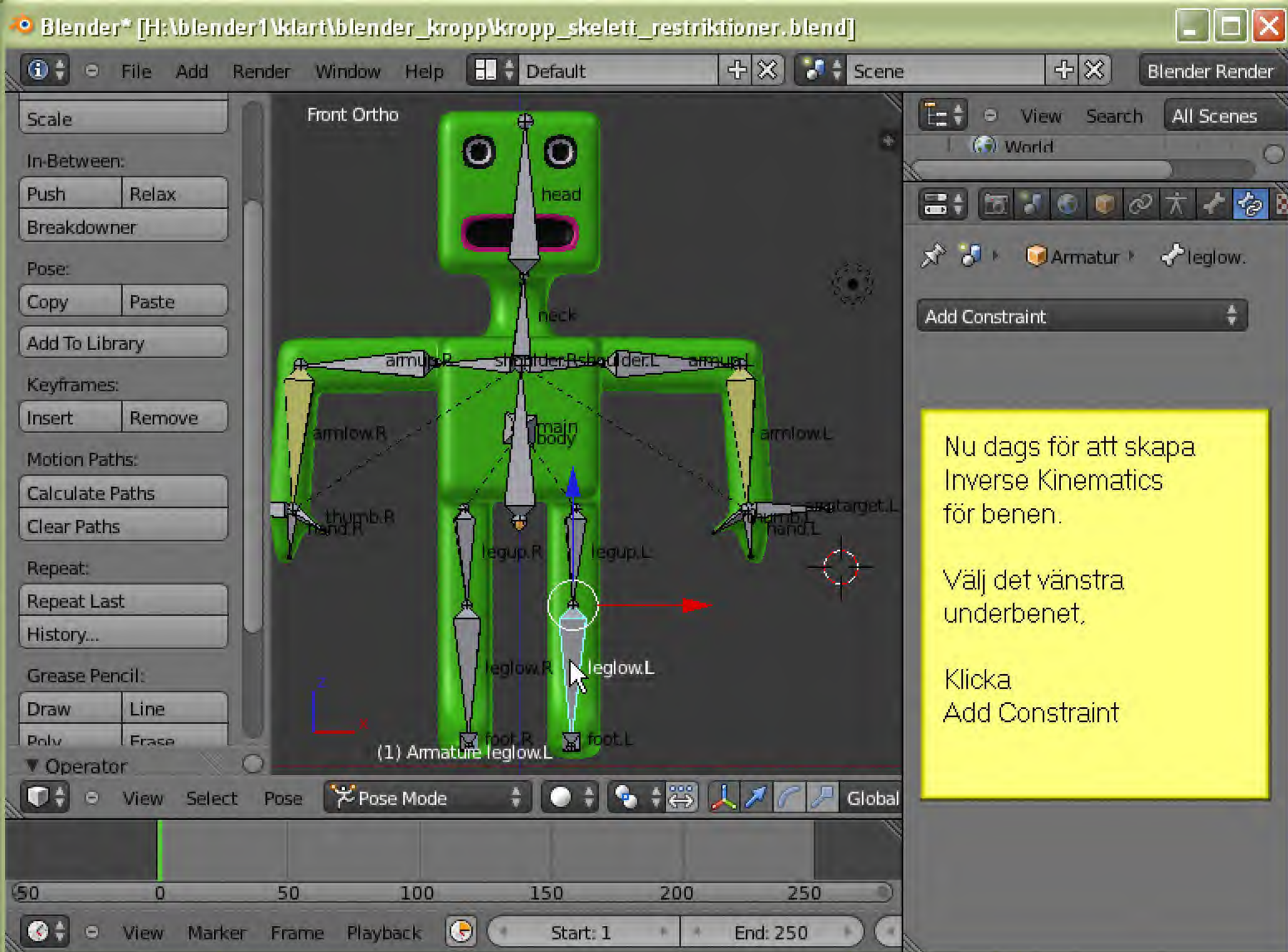




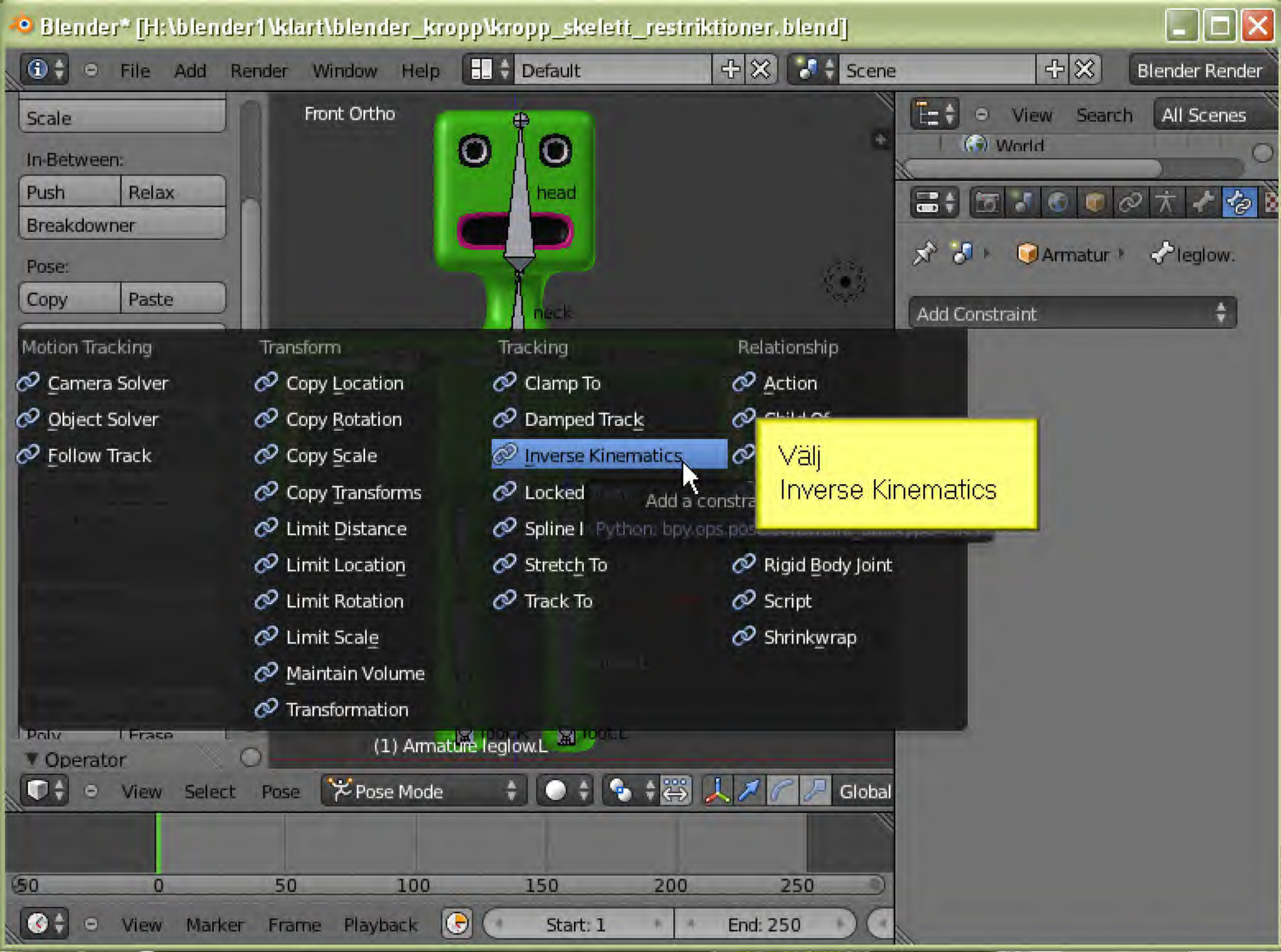




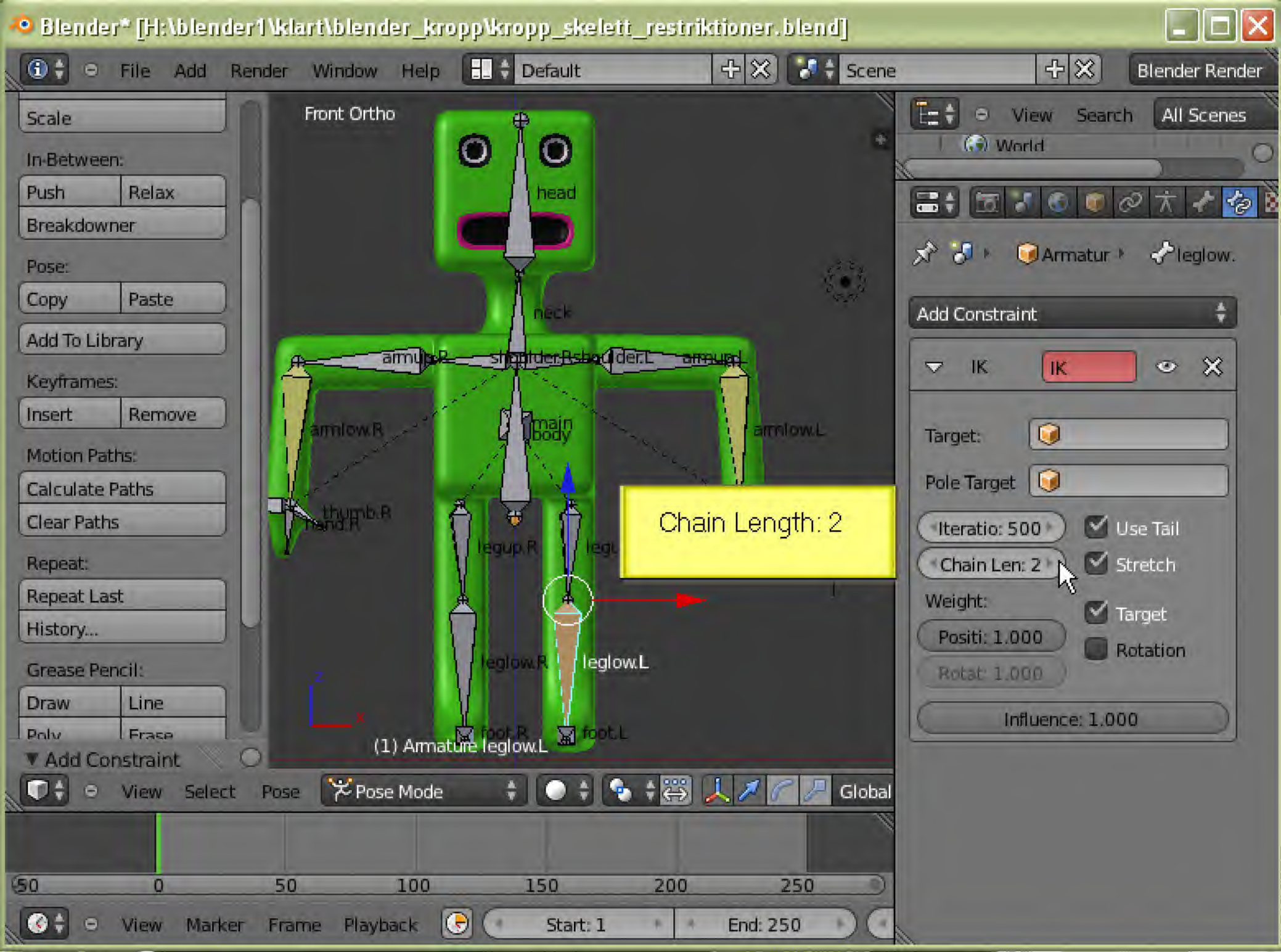




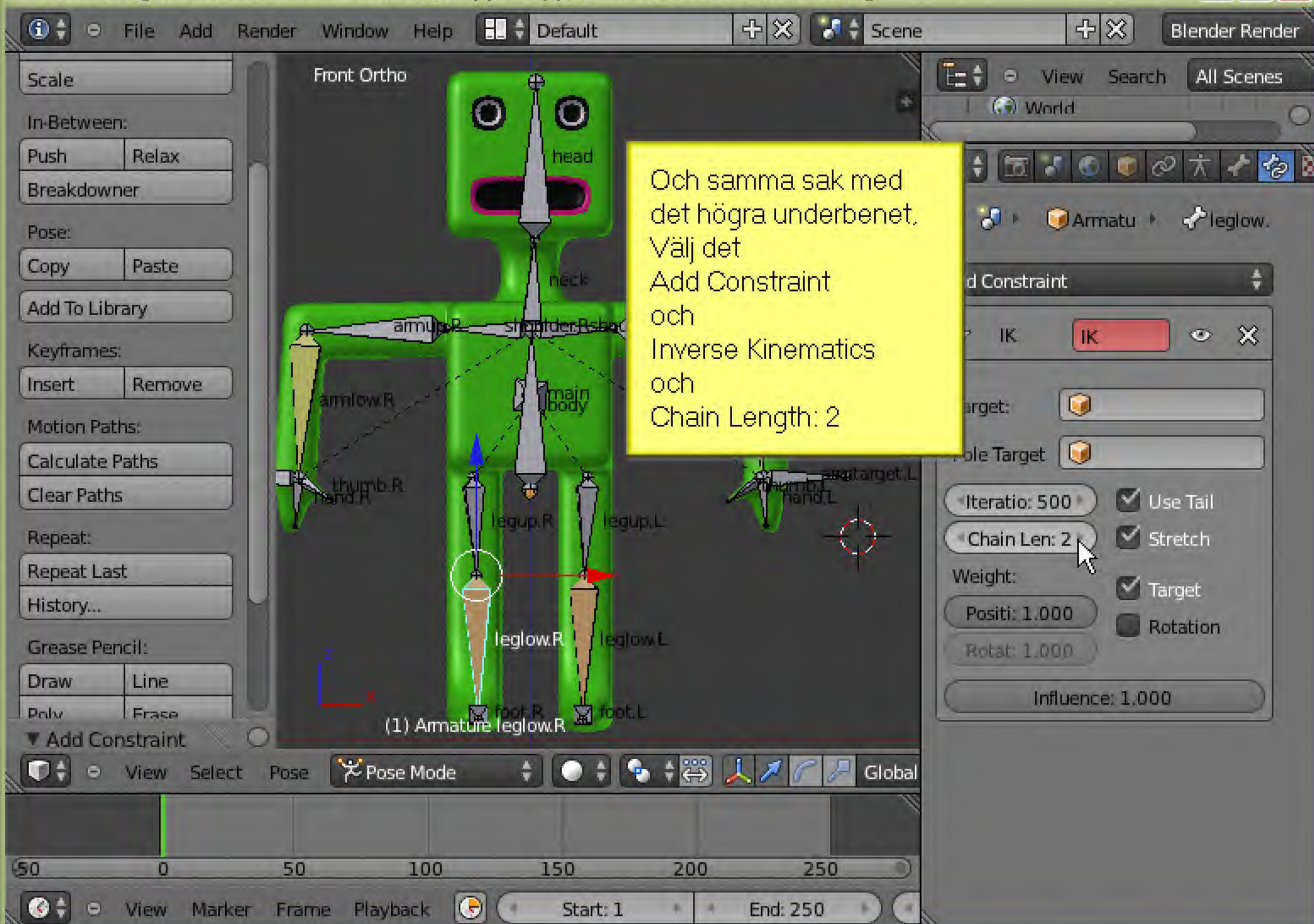




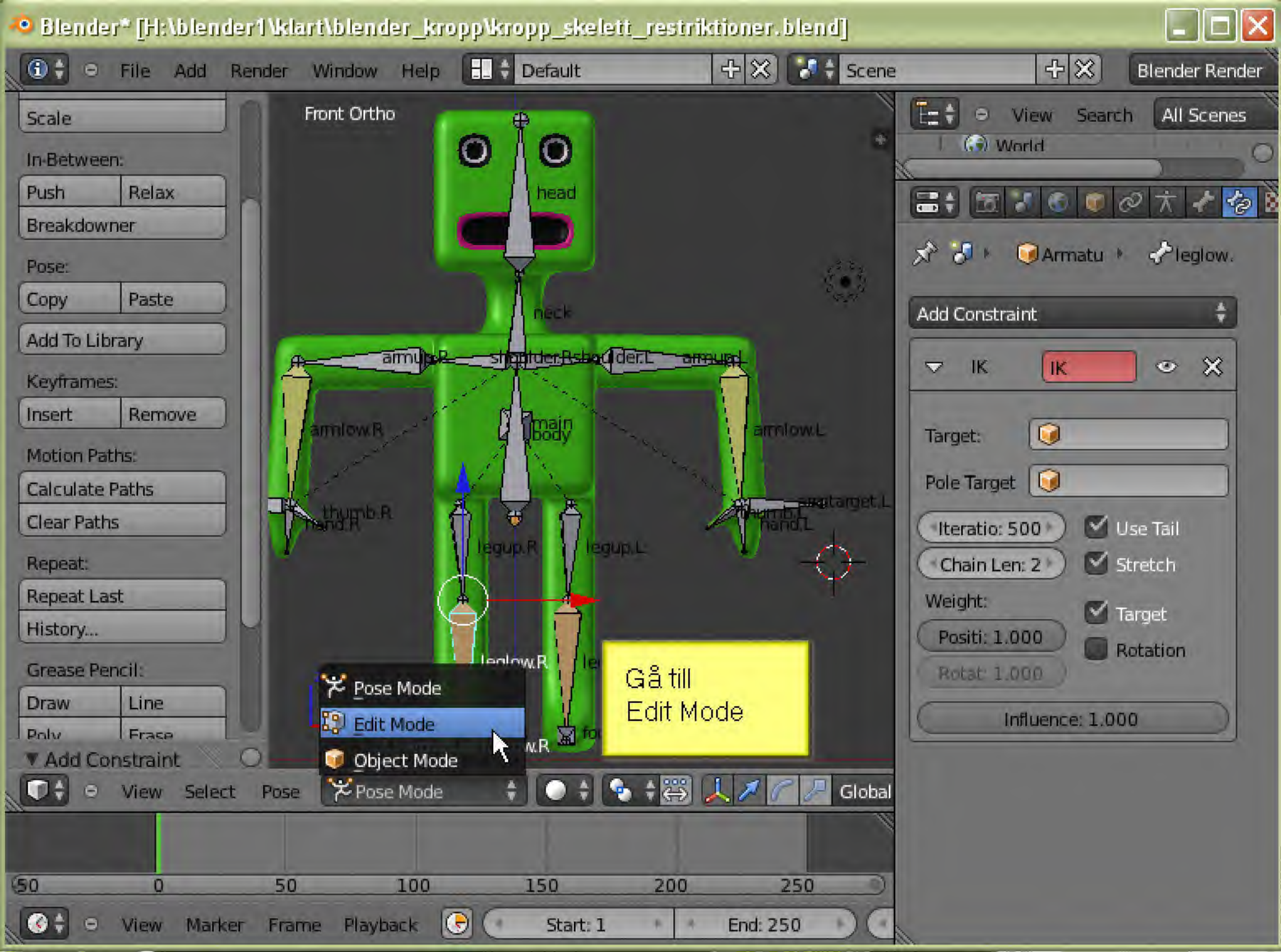




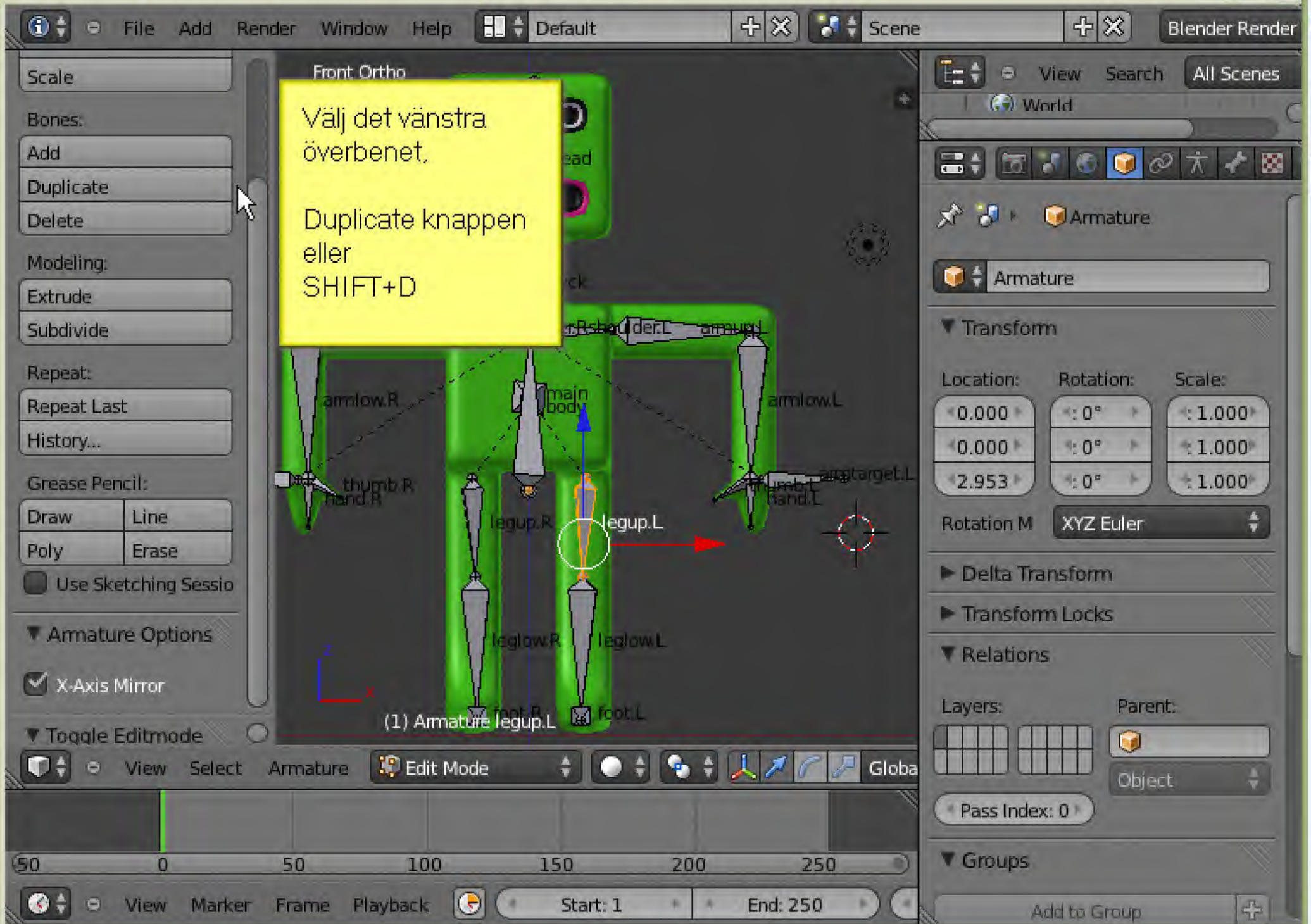




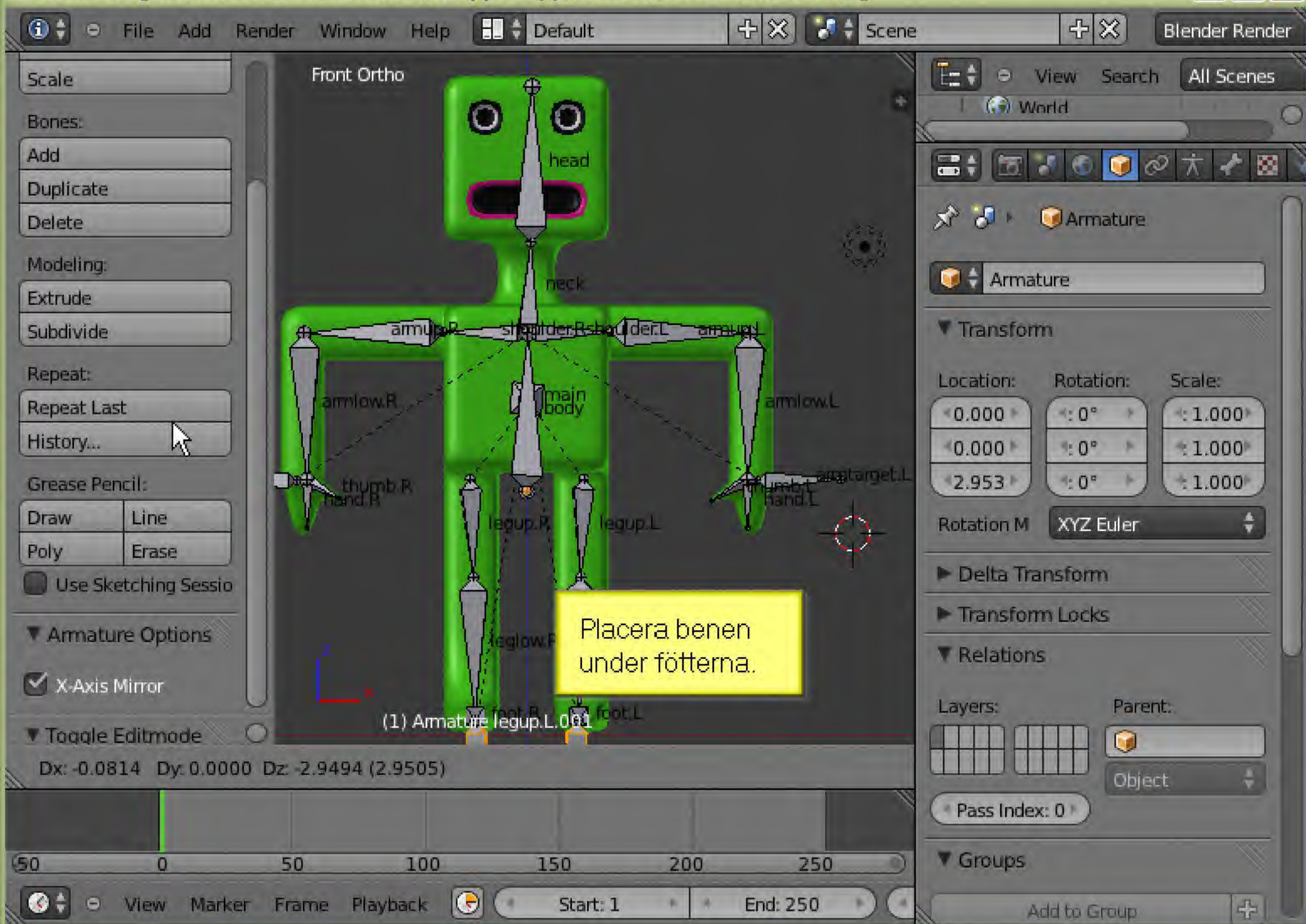




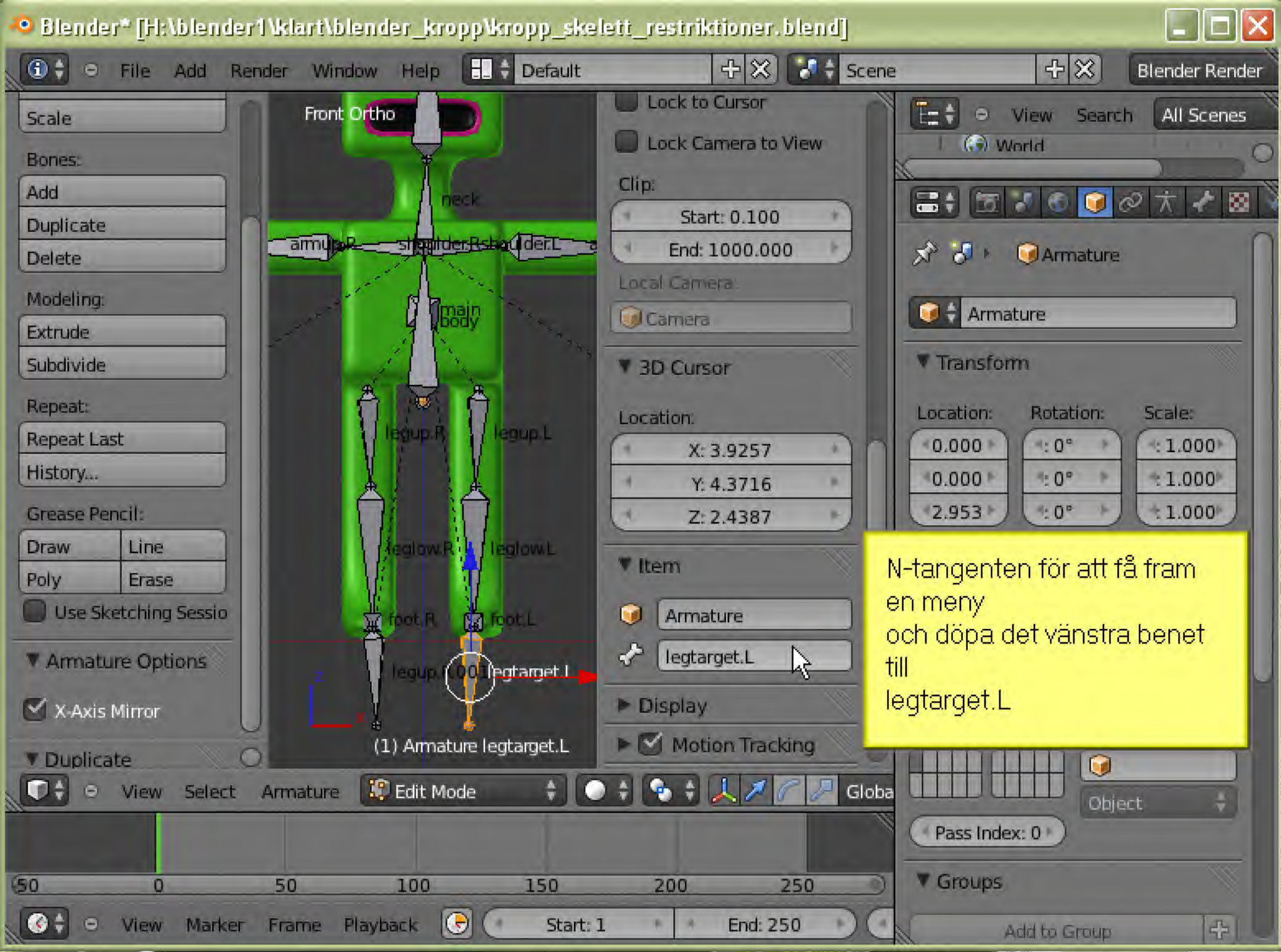




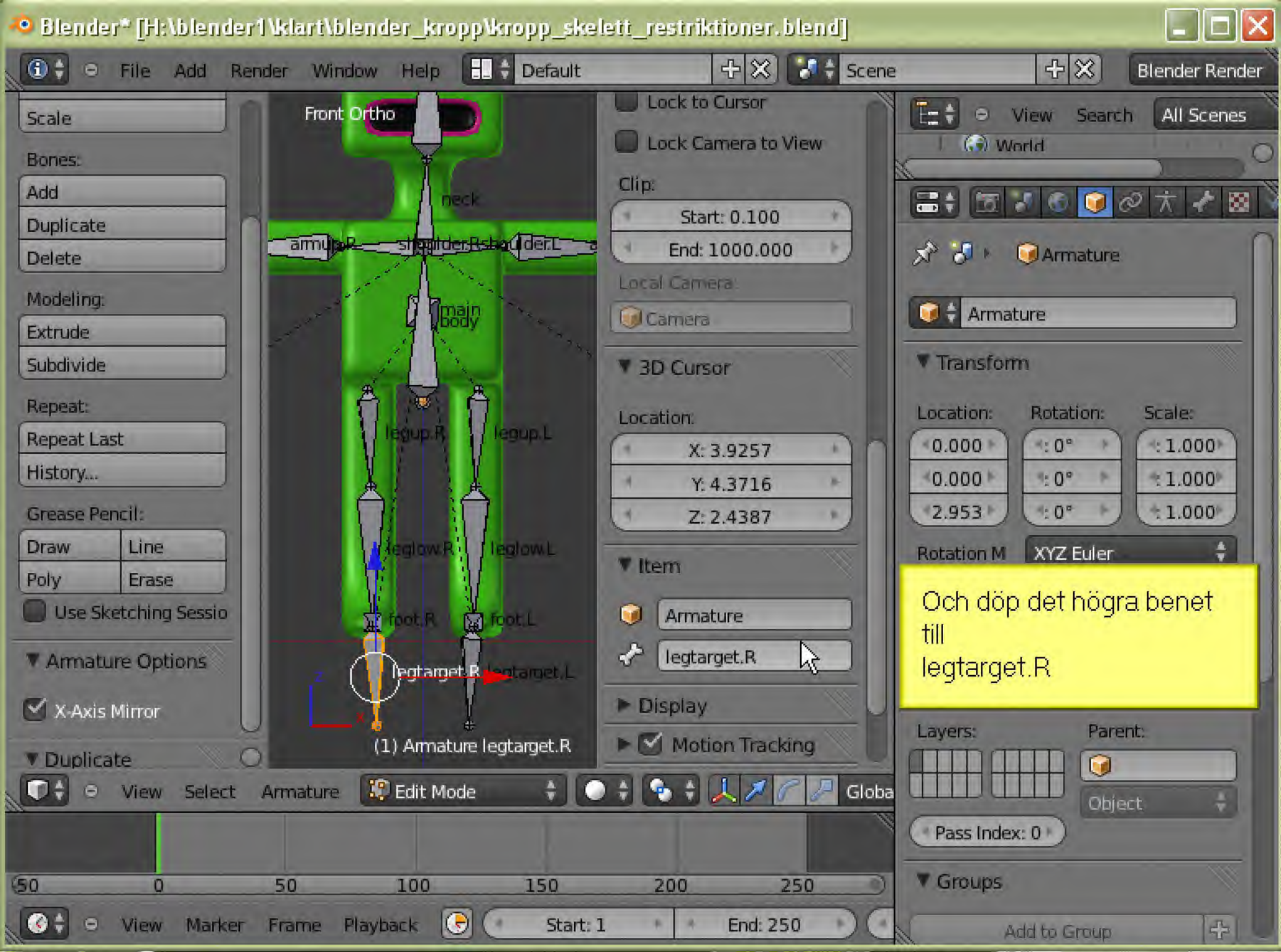












Blender\* [H:\blender1\klart\blender\_kropp\kropp\_skelett\_restriktioner.blend]

File Add Render Window Help

Default

Scene

Blender Render

Scale

Bones:

Add

Duplicate

Delete

Modeling:

Extrude

Subdivide

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Poly

Erase

Use Sketching Session

Armature Options

X-Axis Mirror

Duplicate

View Select Armature Edit Mode

Lock to Cursor

Lock Camera to View

Clip:

Start: 0.100

End: 1000.000

Local Camera:

Camera

3D Cursor

Location:

X: 3.9257

Y: 4.3716

Z: 2.4387

Item

Armature

legtarget.R

Display

Motion Tracking

View Search All Scenes

World

Armature

Armature

Transform

Location:

Rotation:

Scale:

0.000

0°

1.000

0.000

0°

1.000

2.953

0°

1.000

Rotation M XYZ Euler

Och döp det högra benet  
till  
legtarget.R

Layers:

Parent:

Pass Index: 0

Groups

Add to Group

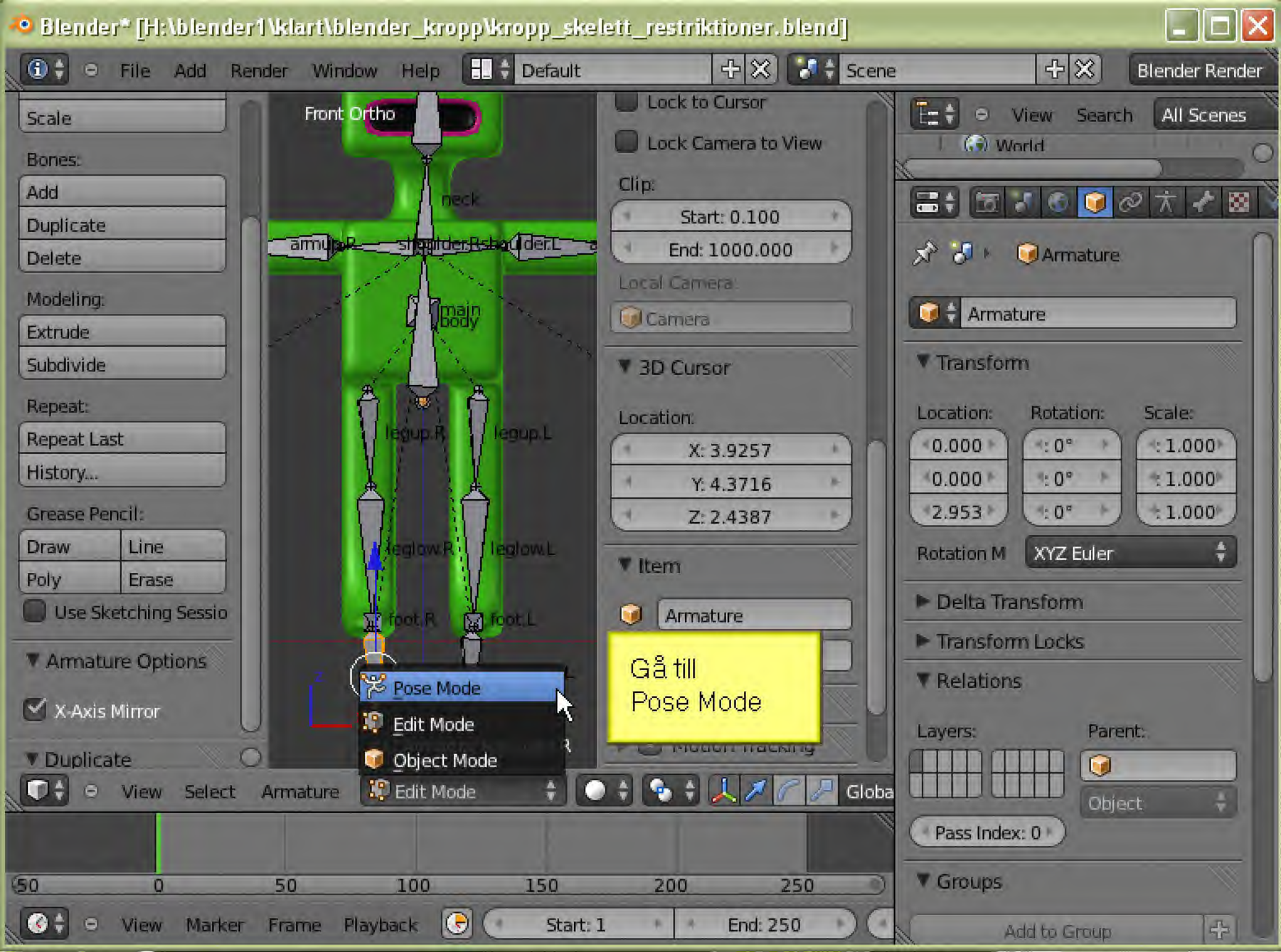
+

View Marker Frame Playback

Start: 1

End: 250







Front Ortho

Scale

In-Between:

Push Relax

Breakdowner

Pose:

Copy Paste

Add To Library

Keyframes:

Insert Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw Line

Polv Frase

Toggle Pose Mode

View Select Pose Pose Mode

View Marker Frame Playback

Start: 1 End: 250

neck

armup.R shoulder.R shoulder.L

main body

legup.R legup.L

leglow.R leglow.L

foot.R foot.L

legtarget.R legtarget.L

(1) Armature leglow.L

Markera det vänstra underbenet och välj Target: Armature Bone: legtarget.L

IK

Target: Armature

Bone

Pole Target

Iteration: 5

Chain Length

Weight:

Positi: 1.0

Rotat: 1.0

body

foot.L

foot.R

hand.L

hand.R

head

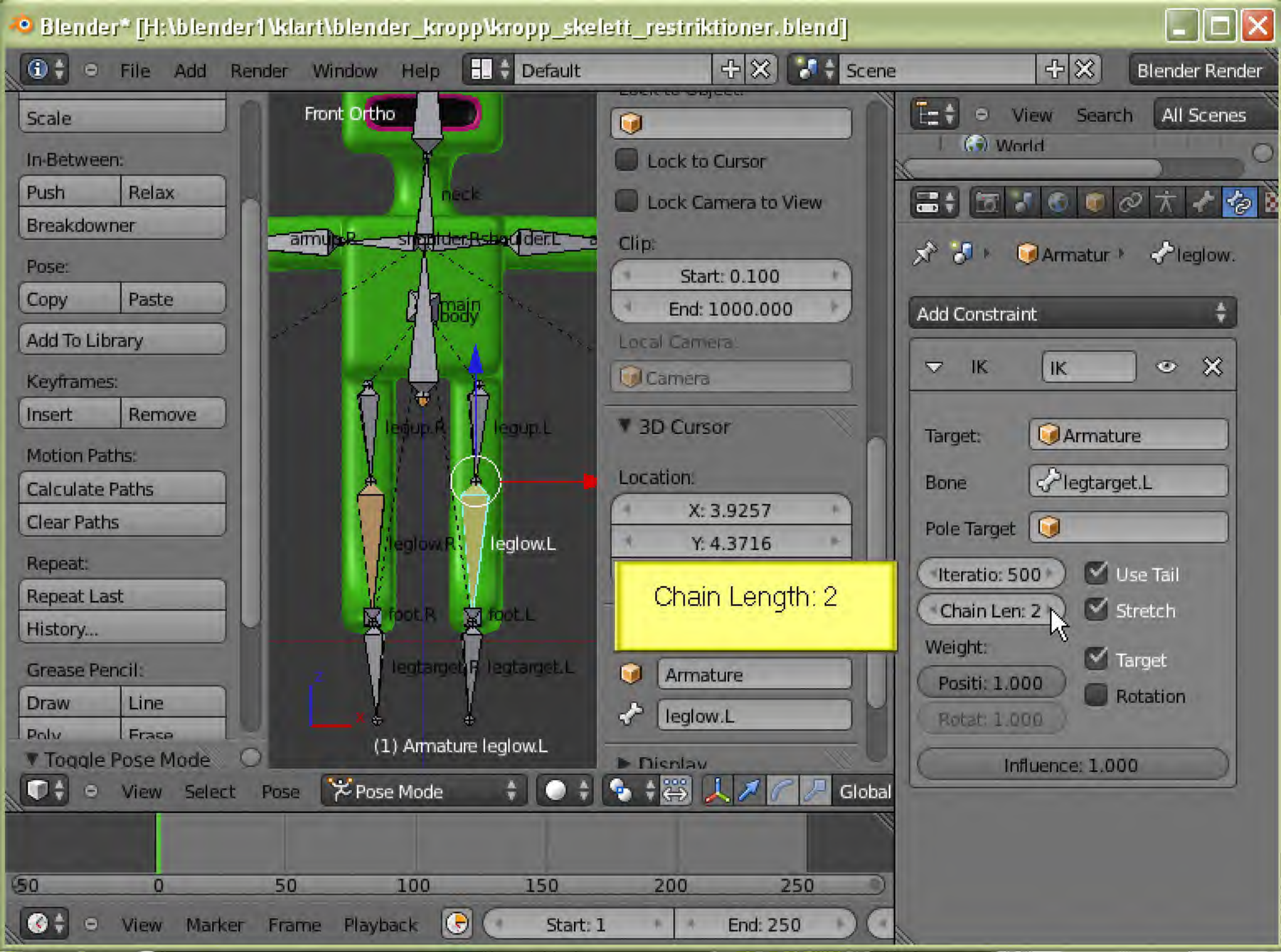
leglow.L

leglow.R

legtarget.L

legtarget.R





Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

Add To Library

Keyframes:

Insert

Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Polv

Frace

Toggle Pose Mode

View

Select

Pose

Pose Mode

Global

Front Ortho

neck

armup.R

shoulder.R

shoulder.L

main body

legup.R

legup.L

leglow.R

leglow.L

foot.R

foot.L

legtarget.R

legtarget.L

(1) Armature leglow.L



Lock to Cursor

Lock Camera to View

Clip:

Start: 0.100

End: 1000.000

Local Camera:

Camera

3D Cursor

Location:

X: 3.9257

Y: 4.3716

Chain Length: 2



Armature



leglow.L

Display



View

Search

All Scenes

World



Armatur

leglow.

Add Constraint



IK

IK



Target:



Armature

Bone



legtarget.L

Pole Target



Iteration: 500



Use Tail

Chain Len: 2



Stretch

Weight:



Target

Positi: 1.000



Rotation

Rotat: 1.000

Influence: 1.000

50 0 50 100 150 200 250



View

Marker

Frame

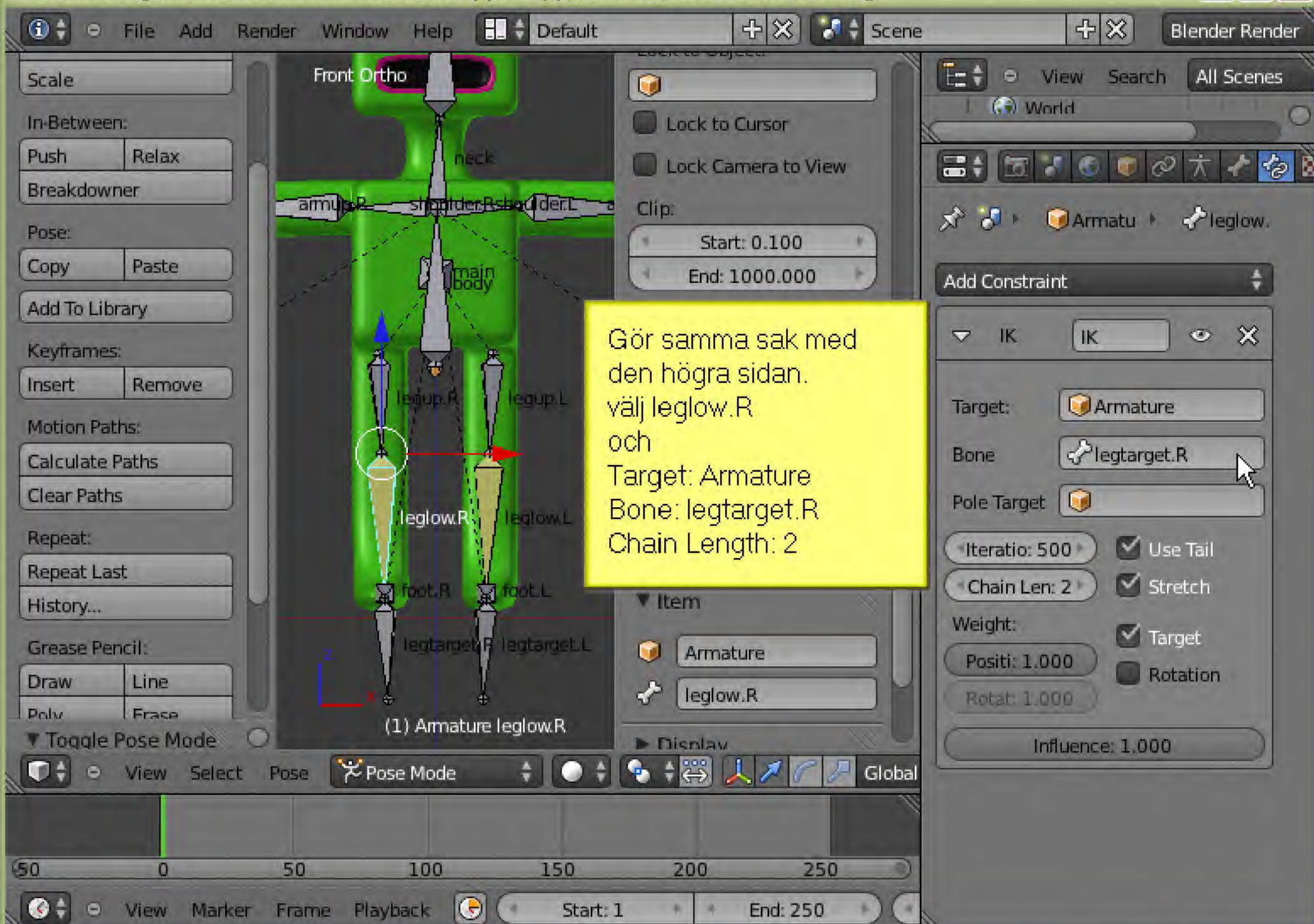
Playback



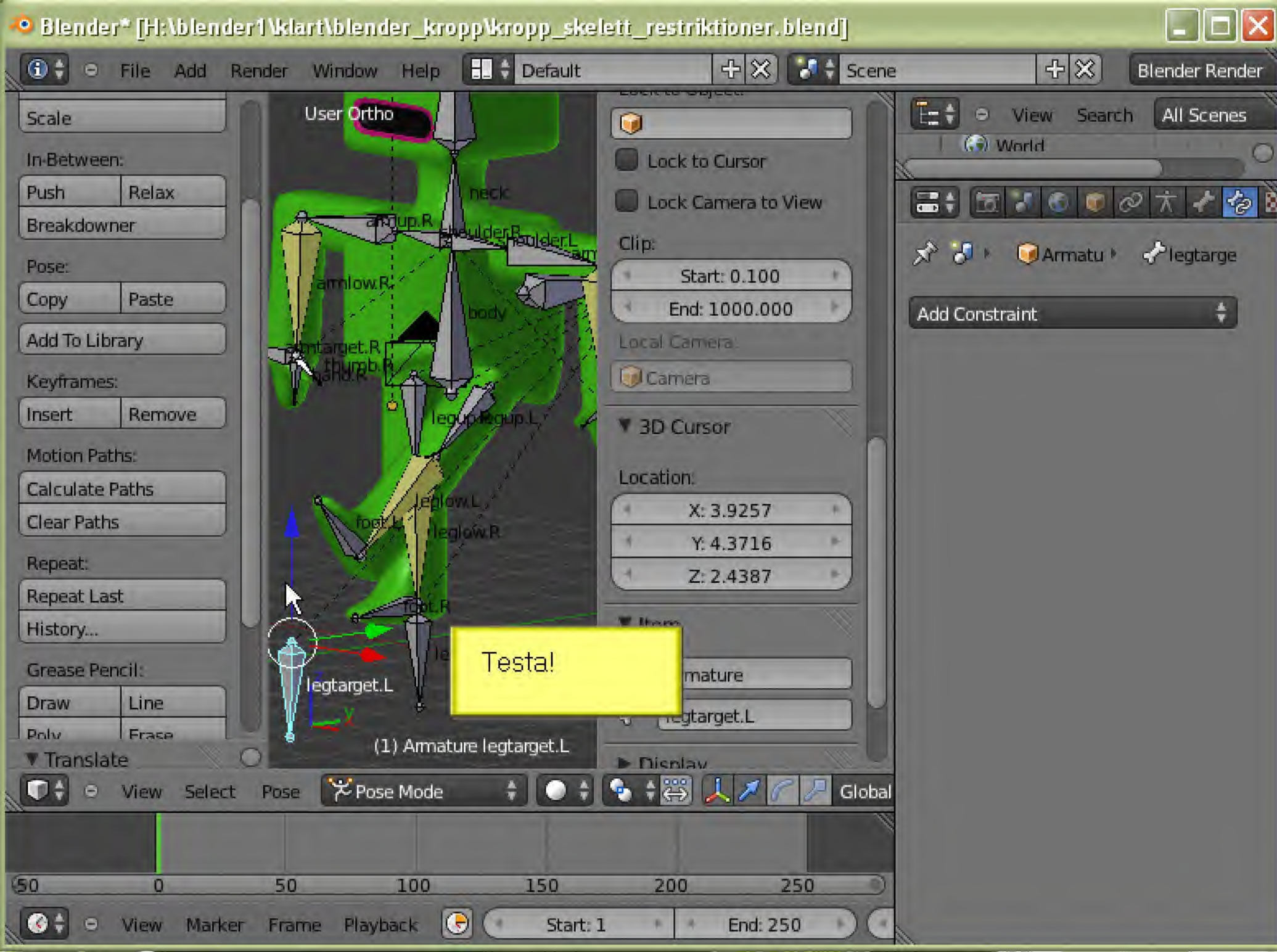
Start: 1

End: 250

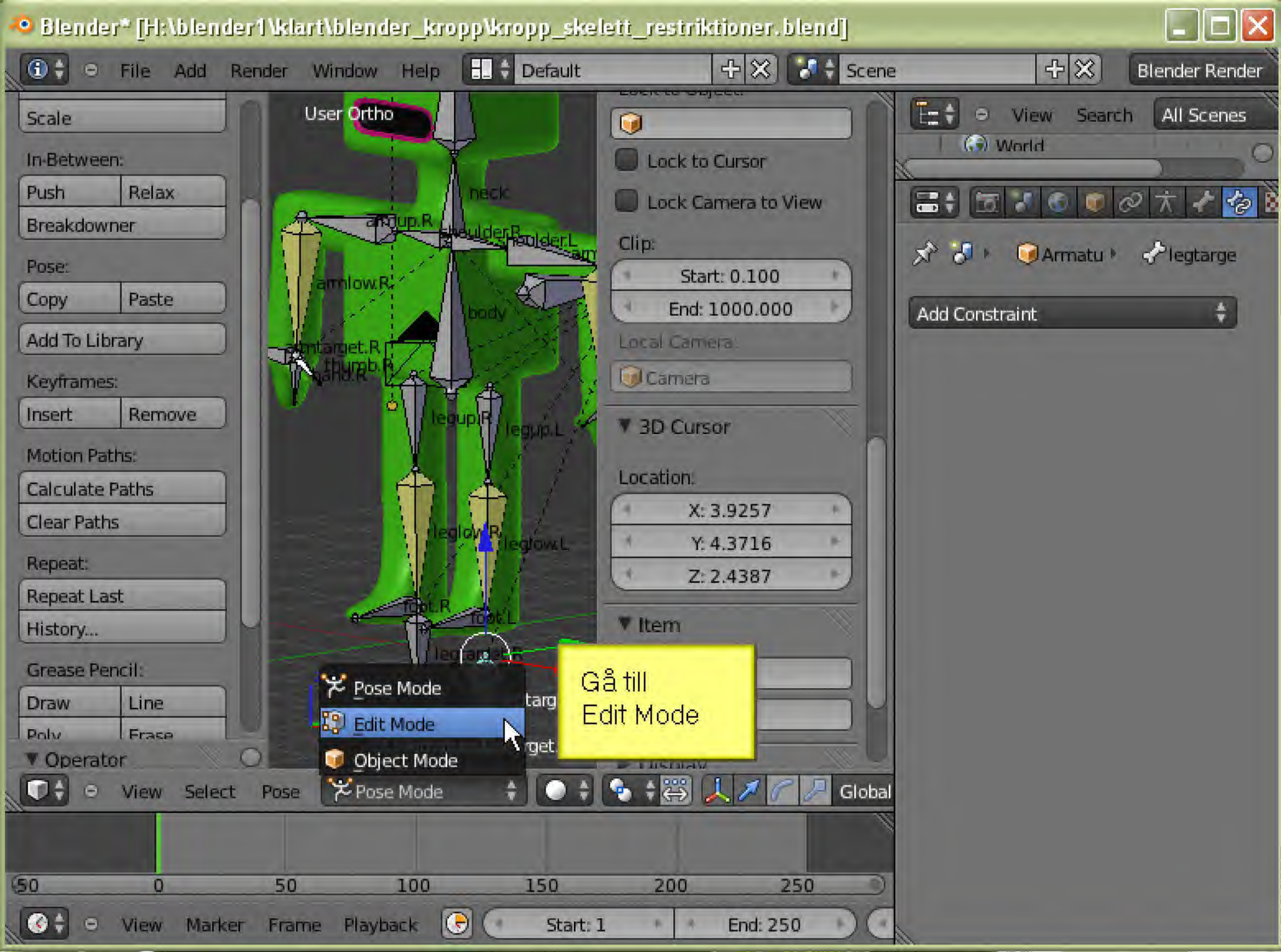




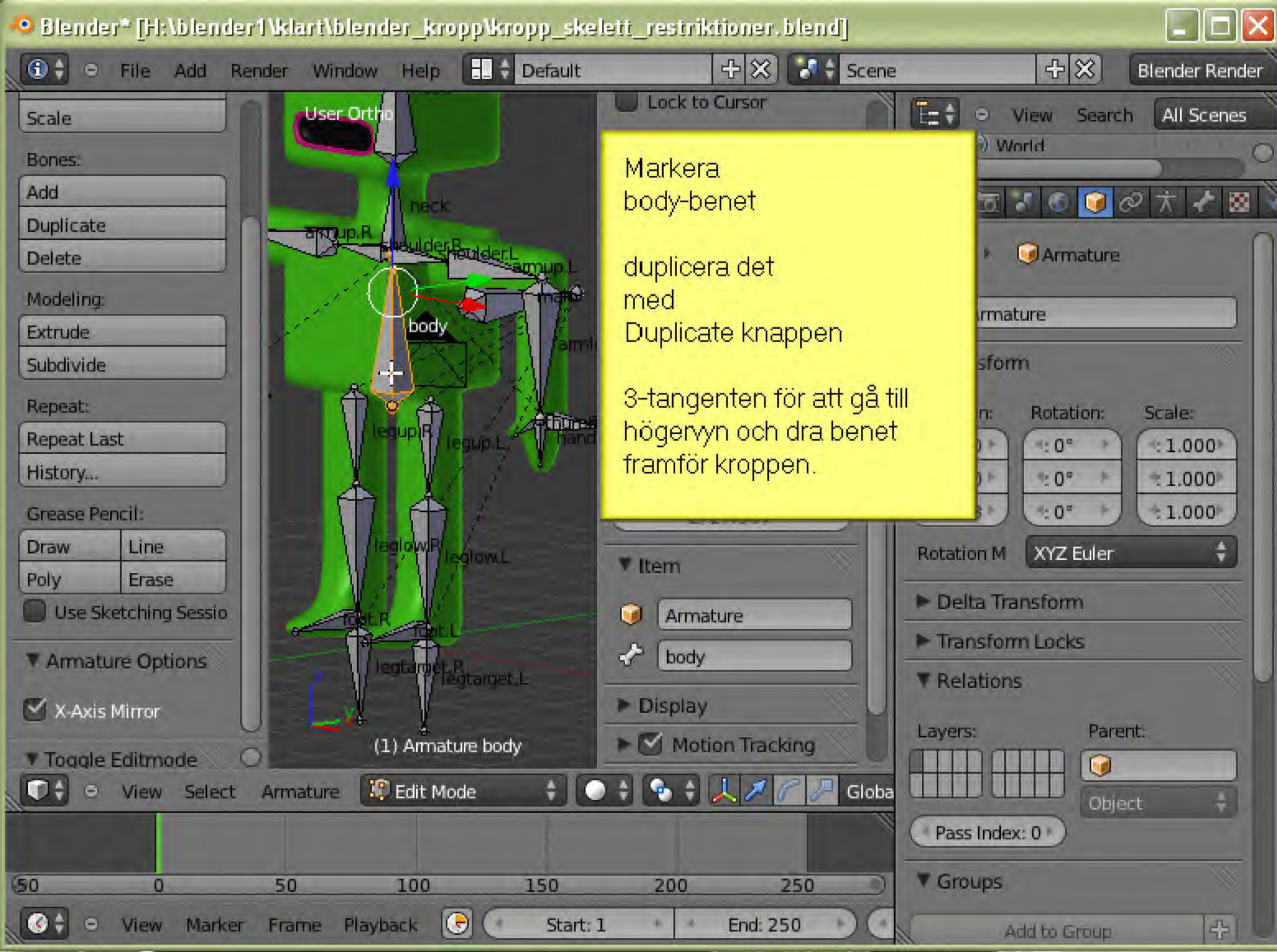




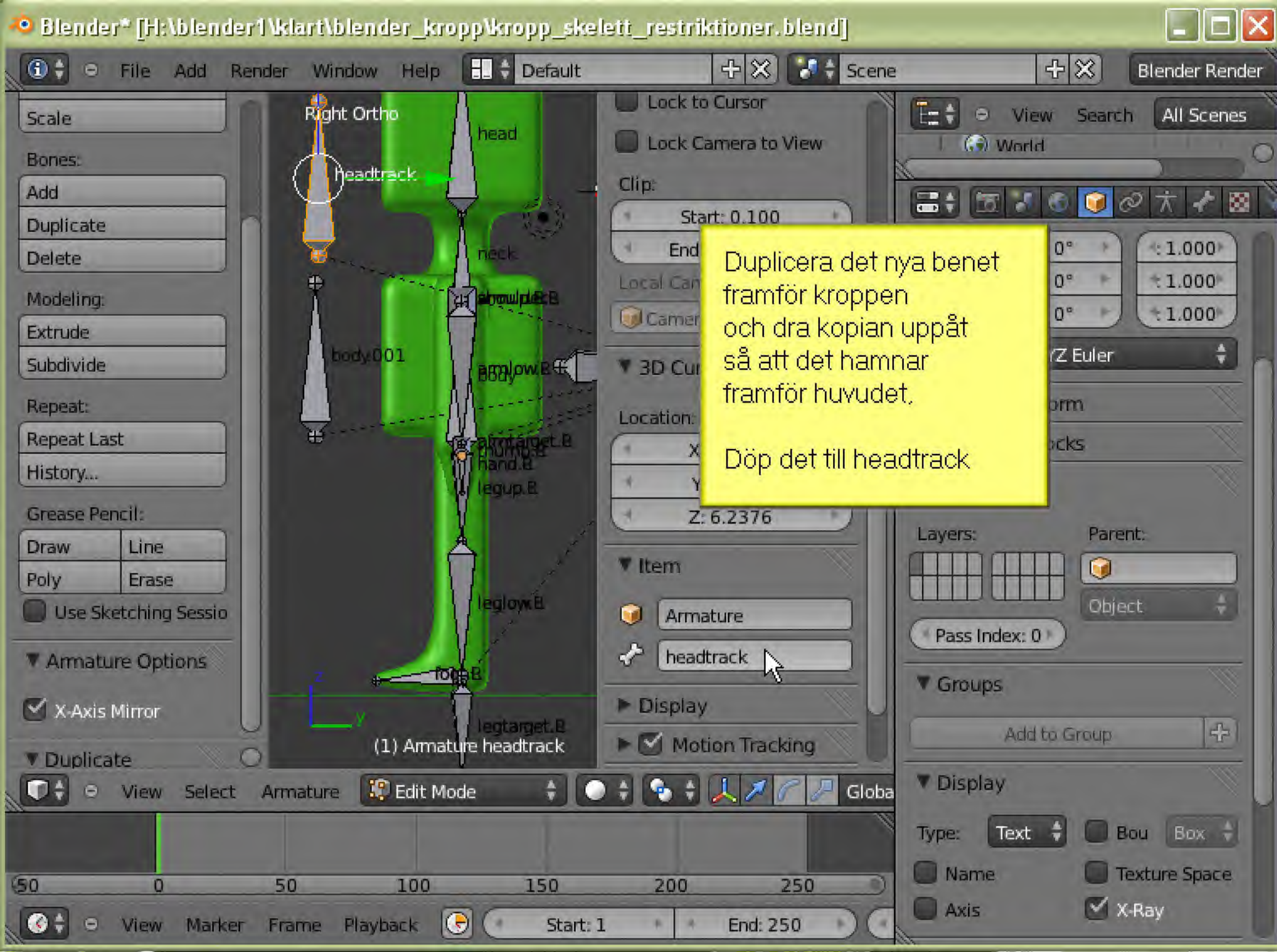




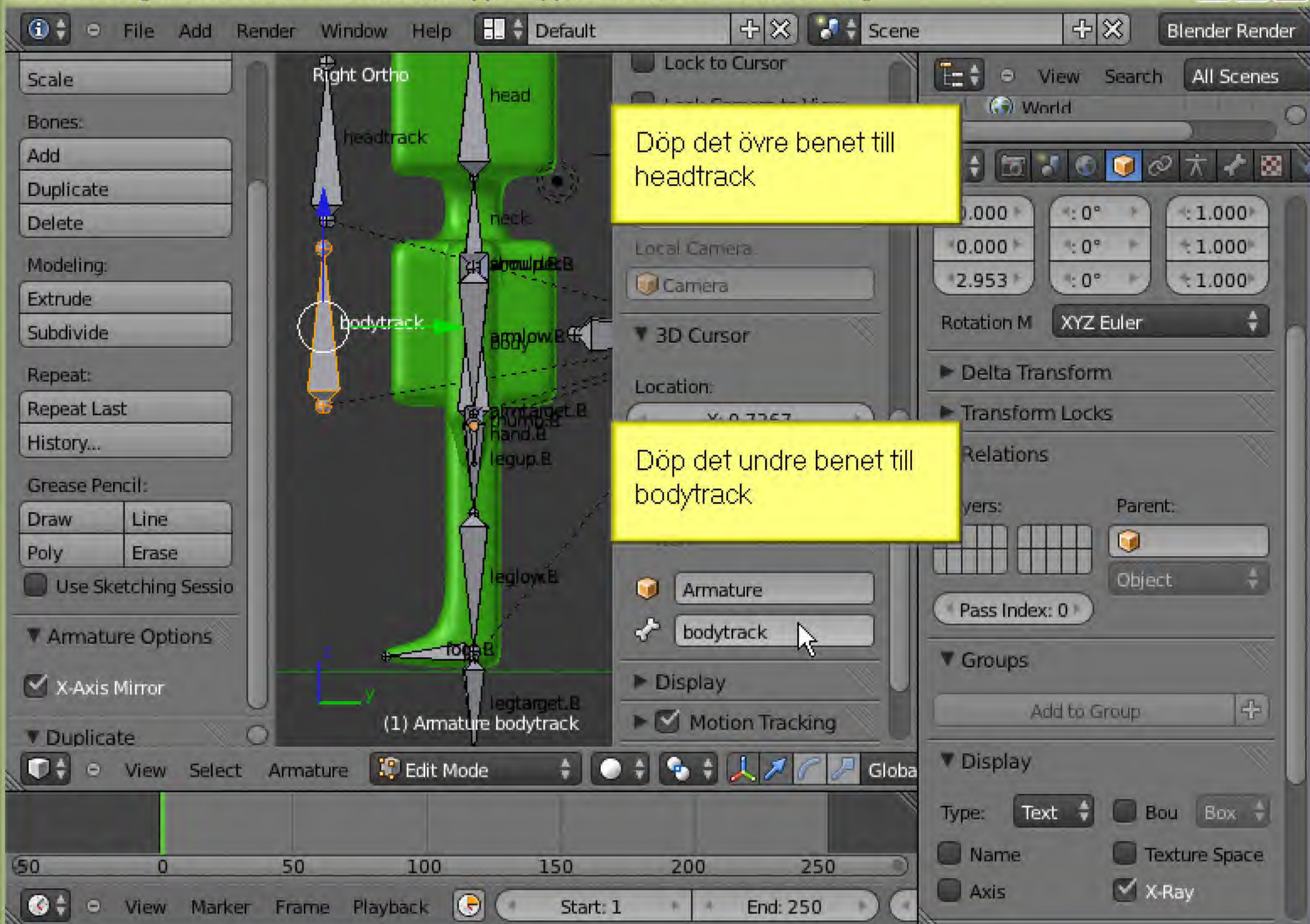




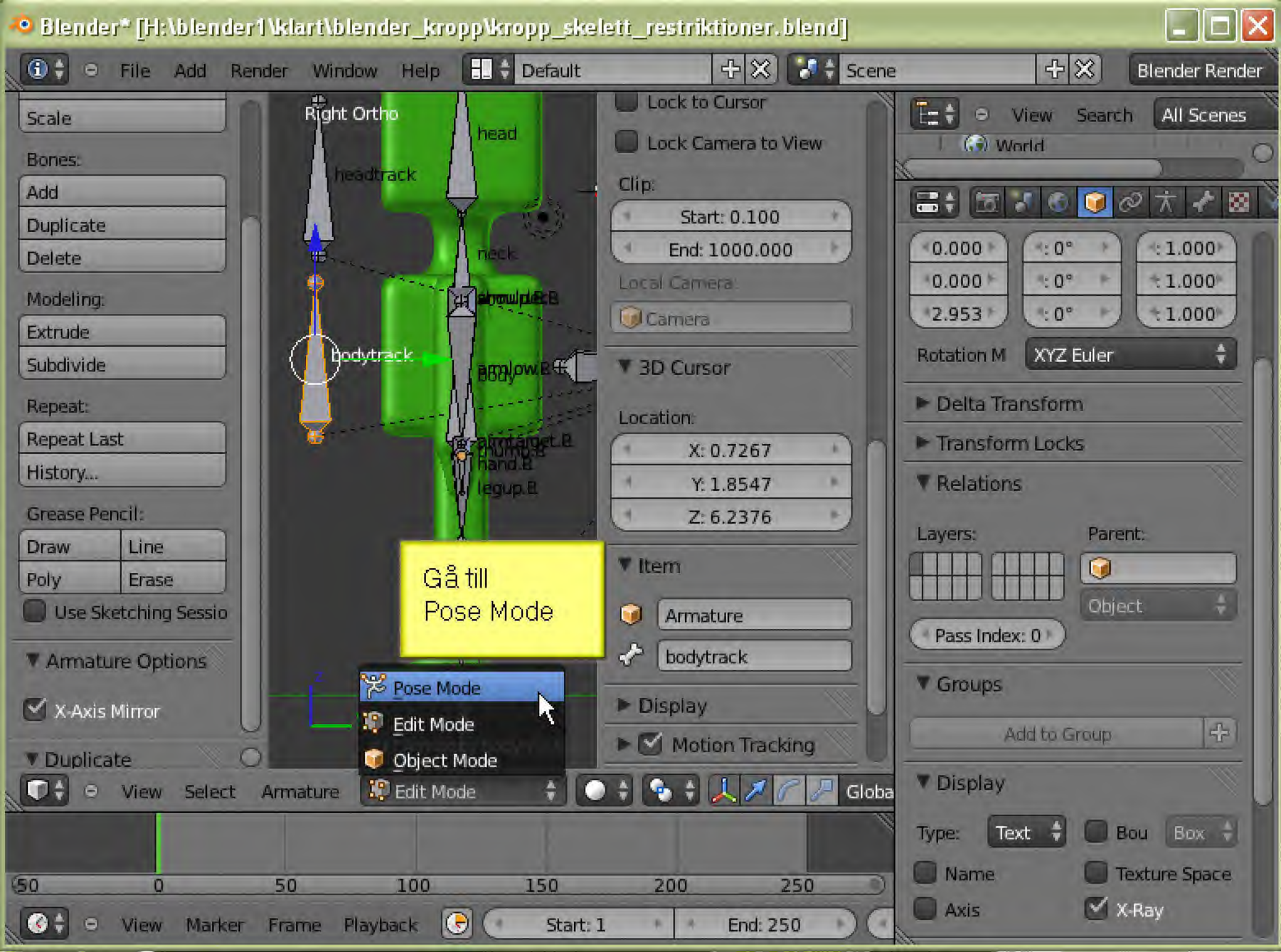




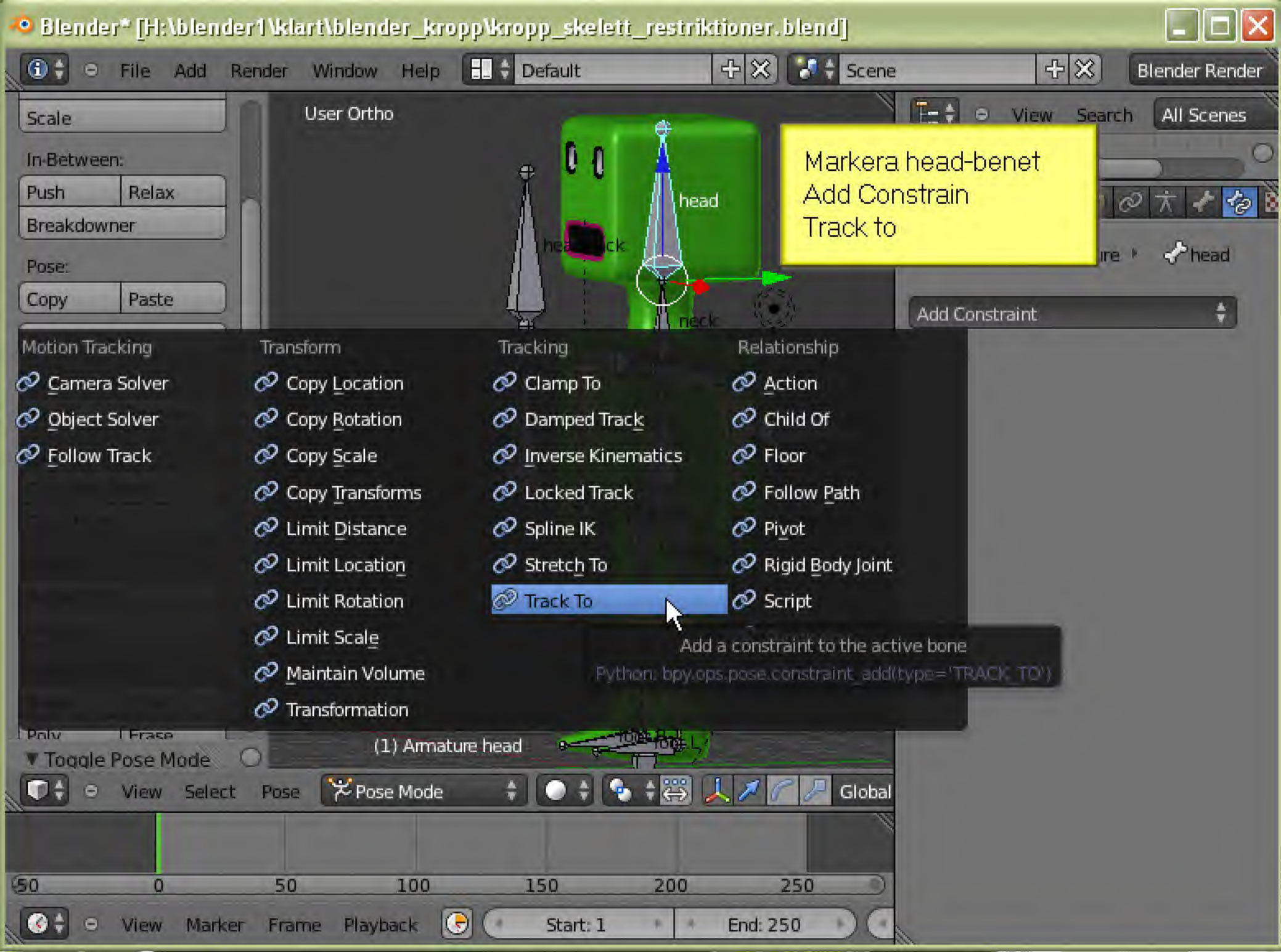












Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

User Ortho

View

Search

All Scenes

Markera head-benet  
Add Constrai  
Track to

Motion Tracking

Transform

Tracking

Relationship

Camera Solver

Copy Location

Clamp To

Action

Object Solver

Copy Rotation

Damped Track

Child Of

Follow Track

Copy Scale

Inverse Kinematics

Floor

Copy Transforms

Locked Track

Follow Path

Limit Distance

Spline IK

Pivot

Limit Location

Stretch To

Rigid Body Joint

Limit Rotation

Track To

Script

Limit Scale

Maintain Volume

Transformation

Add a constraint to the active bone

Python: bpy.ops.pose.constraint\_add(type='TRACK\_TO')

Toggle Pose Mode

(1) Armature head

View Select Pose Pose Mode

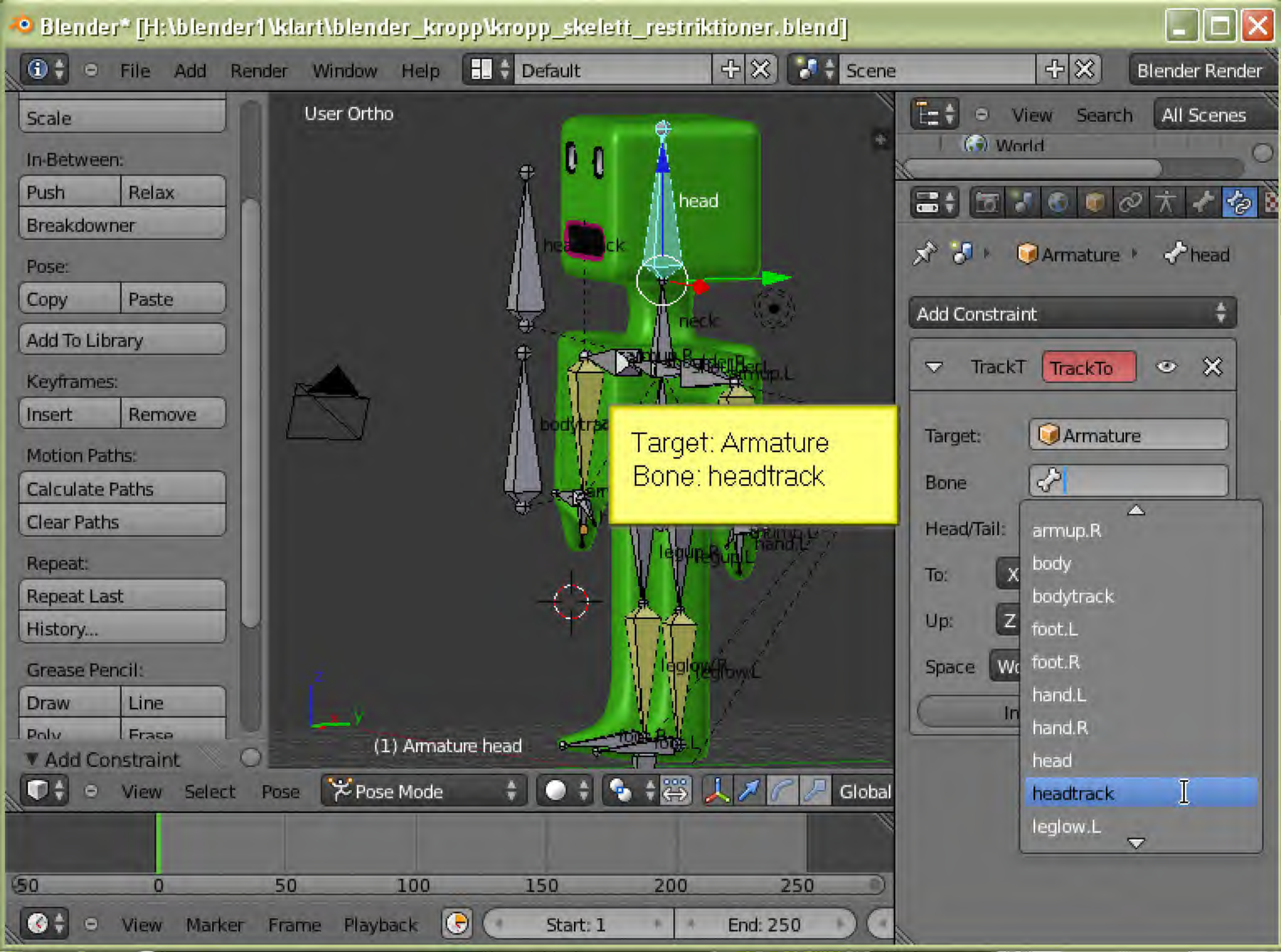
Global

View Marker Frame Playback

Start: 1

End: 250





Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

Add To Library

Keyframes:

Insert

Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Polv

Frasc

Add Constraint



View

Select

Pose



Pose Mode



Global



View

Search

All Scenes



World



Armature

head

Add Constraint

TrackT

TrackTo



Target:

Armature

Bone



Head/Tail:

armup.R

To:

X

body

Up:

Z

foot.L

Space

W

foot.R

hand.L

hand.R

head

headtrack

leglow.L

(1) Armature head

Start: 1

End: 250



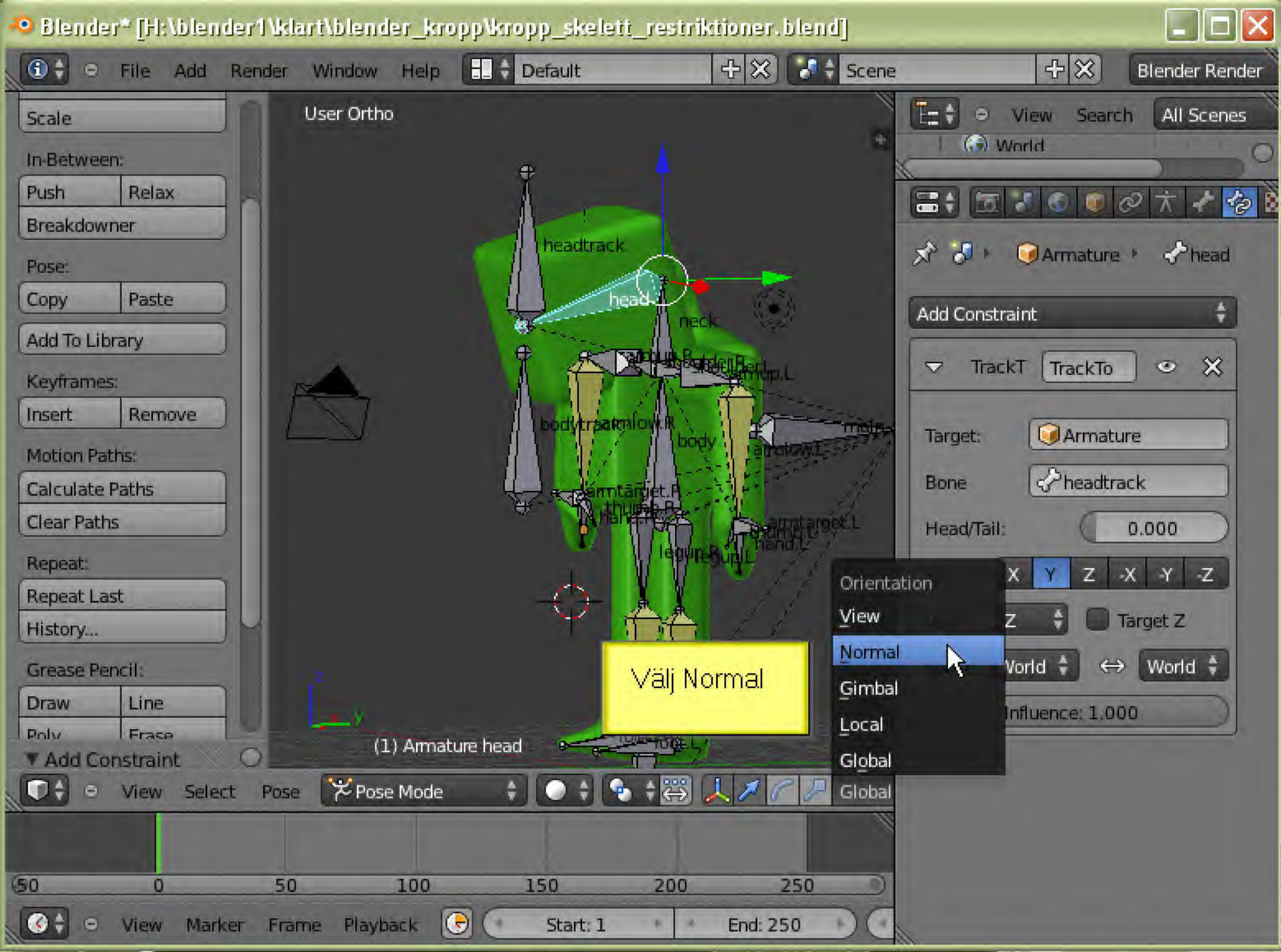
Blender 2.79 interface showing a 3D model of a character in Pose Mode. The character is a green, stylized figure with a yellow head and a green body. The model is labeled with various parts: headtrack, head, neck, body, hand, leg, and foot. A yellow text box is overlaid on the model, stating: "Figuren böjer huvudet framåt" (The figure bends its head forward).

The interface includes a top menu bar (File, Add, Render, Window, Help), a top toolbar (Default, Scene, Blender Render), and a left sidebar (Scale, In-Between, Push, Relax, Breakdowner, Pose, Copy, Paste, Add To Library, Keyframes, Insert, Remove, Motion Paths, Calculate Paths, Clear Paths, Repeat, Repeat Last, History..., Grease Pencil, Draw, Line, Poly, Face, Add Constraint).

The right sidebar shows the Properties panel for the selected object (Armature > head). It displays the "Add Constraint" dropdown menu, which is set to "TrackTo". The "TrackTo" constraint is active, and its properties are shown: "Head/Tail" is set to 0.000, "To" is set to Y, "Up" is set to Z, "Space" is set to World, and "Influence" is set to 1.000.

The bottom status bar shows the current frame (1) and the total number of frames (250).





File

Add

Render

Window

Help



Default



Scene



Blender Render

Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

Add To Library

Keyframes:

Insert

Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Polv

Frace

Add Constraint



View

Select

Pose



Pose Mode



3D Viewport



2D Viewport



Edit

Global



View

Search

All Scenes



World



Armature



head



Pin



Pin

Add Constraint



TrackT

TrackTo



Target:

Armature

Bone

headtrack

Head/Tail:

0.000

Orientation

View

Normal

Gimbal

Local

Global

Global

X

Y

Z

-X

-Y

-Z

Z

Z

Z

Z

Z

Z

World

World

World

World

World

World

World

World

World

World

World

Influence: 1.000

Influence: 1.000

Influence: 1.000

Influence: 1.000

Influence: 1.000

Influence: 1.000

Välj Normal

(1) Armature head

50

0

50

100

150

200

250



View

Marker

Frame

Playback



Start: 1

End: 250



Blender 2.79 interface showing a 3D model of a green humanoid figure in Pose Mode. The figure is labeled "User Ortho". The interface includes a top menu bar (File, Add, Render, Window, Help), a left sidebar with tools (Scale, In-Between, Breakdowner, Pose, Copy, Paste, Add To Library, Keyframes, Motion Paths, Repeat, History, Grease Pencil), a central 3D viewport, and a right sidebar with the Properties panel (Add Constraint, TrackTo).

The 3D viewport shows the figure's skeleton and various constraints. A yellow box highlights the text:

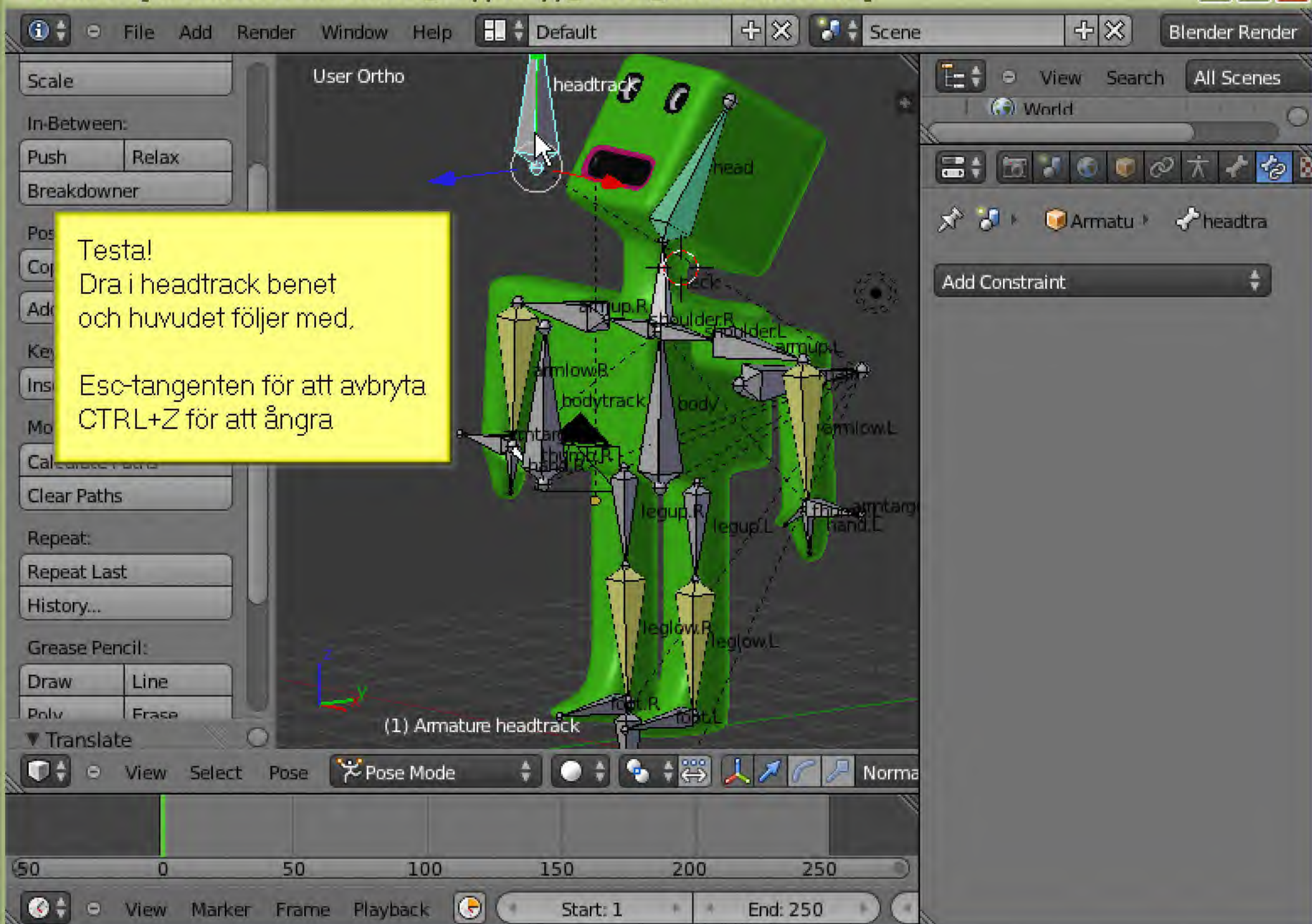
Välj  
To: -Z  
Up: Y

The right sidebar shows the "Add Constraint" panel with the following settings:

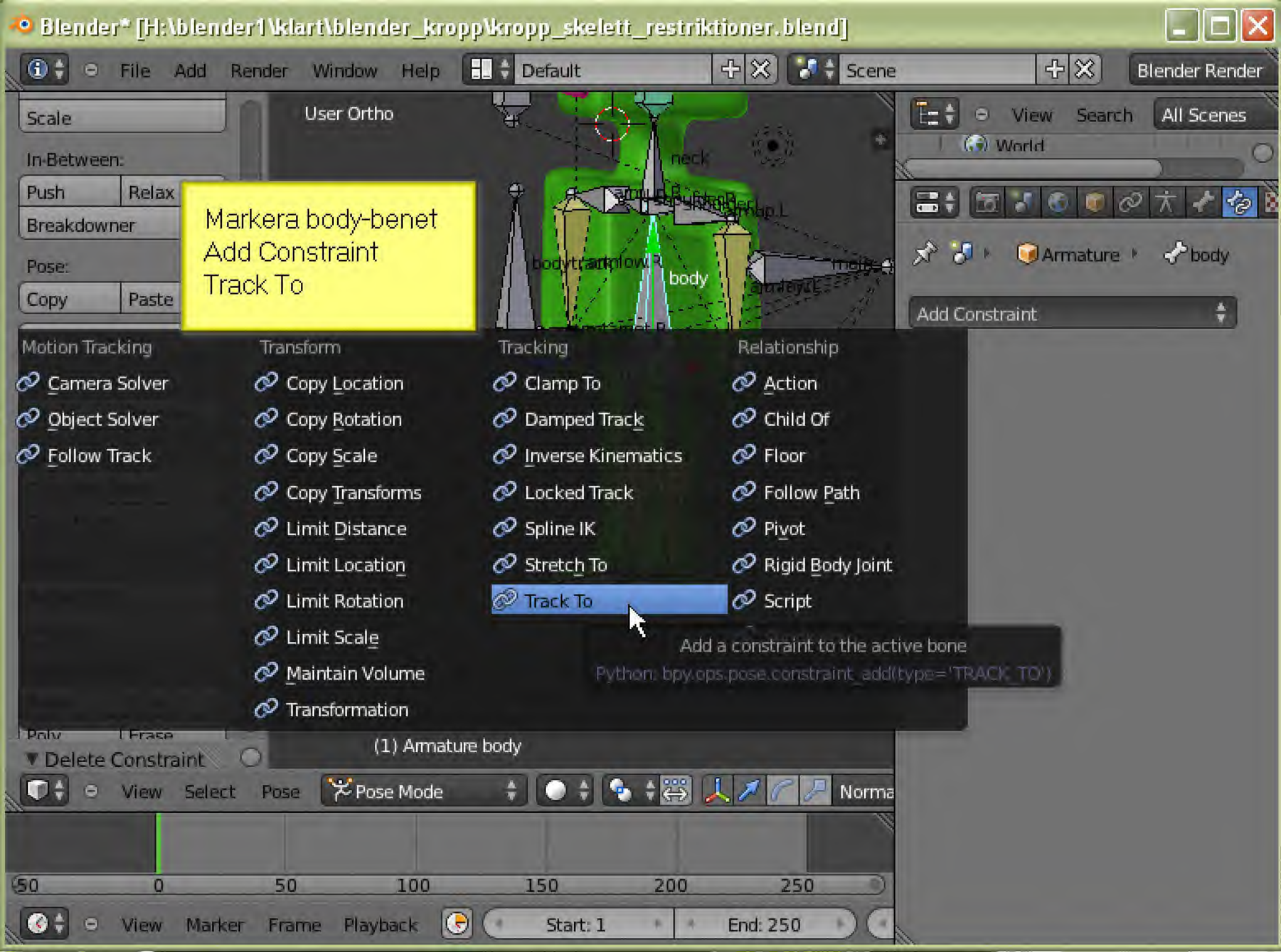
- TrackT: TrackTo
- Target: Armature
- Bone: headtrack
- Head/Tail: 0.000
- To: X Y Z -X -Y **Z**
- Up: Y ☒ Target Z
- Space: World ☒ World
- Influence: 1.000

The bottom status bar shows the timeline (Start: 1, End: 250) and the current mode (Pose Mode).









Markera body-benet  
Add Constraint  
Track To

- | Motion Tracking | Transform       | Tracking           | Relationship     |
|-----------------|-----------------|--------------------|------------------|
| Camera Solver   | Copy Location   | Clamp To           | Action           |
| Object Solver   | Copy Rotation   | Damped Track       | Child Of         |
| Follow Track    | Copy Scale      | Inverse Kinematics | Floor            |
|                 | Copy Transforms | Locked Track       | Follow Path      |
|                 | Limit Distance  | Spline IK          | Pivot            |
|                 | Limit Location  | Stretch To         | Rigid Body Joint |
|                 | Limit Rotation  | Track To           | Script           |
|                 | Limit Scale     |                    |                  |
|                 | Maintain Volume |                    |                  |
|                 | Transformation  |                    |                  |

Add a constraint to the active bone  
Python: bpy.ops.pose.constraint\_add(type='TRACK\_TO')



1102

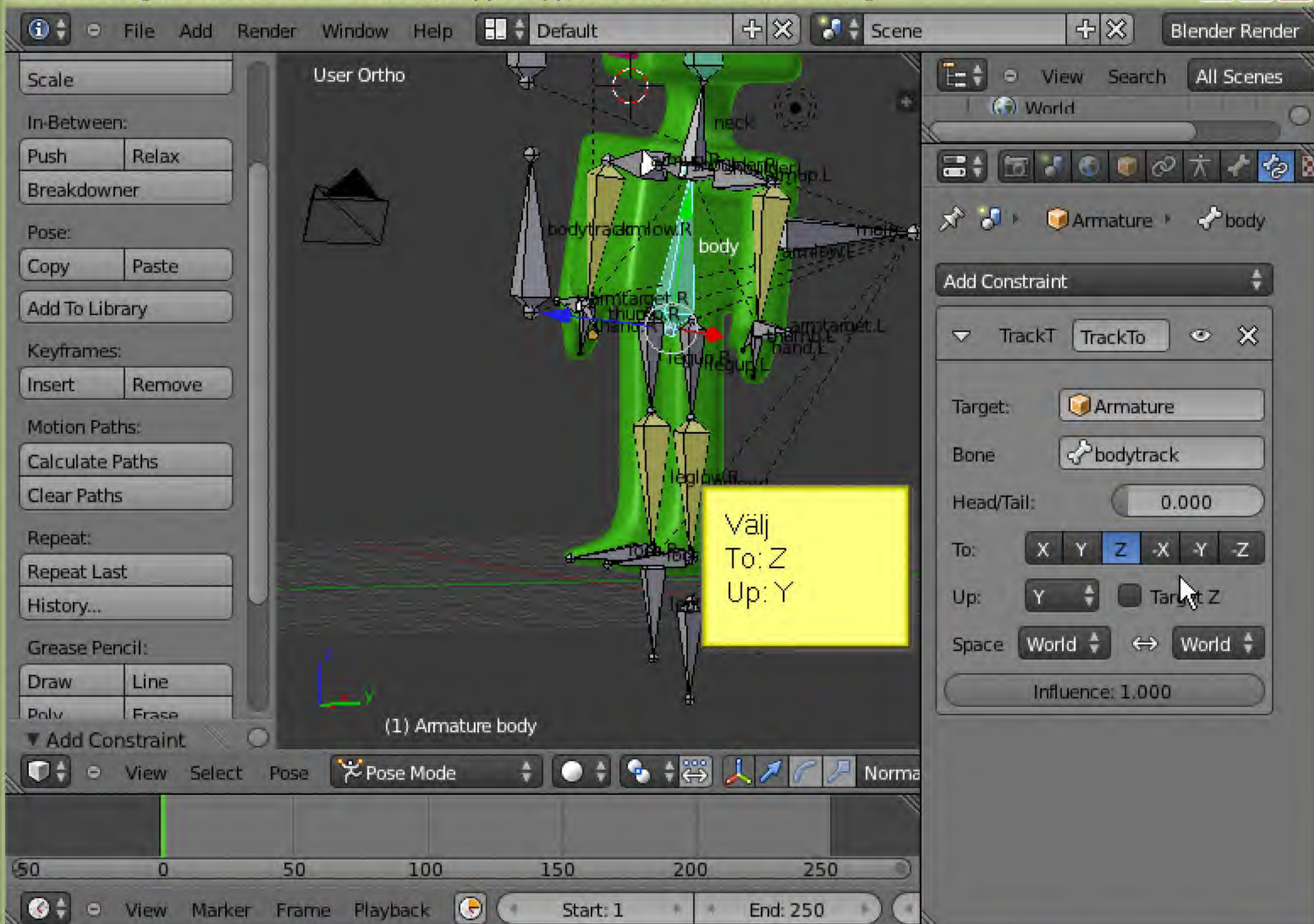
Influence: 1.000

(1) Armature body

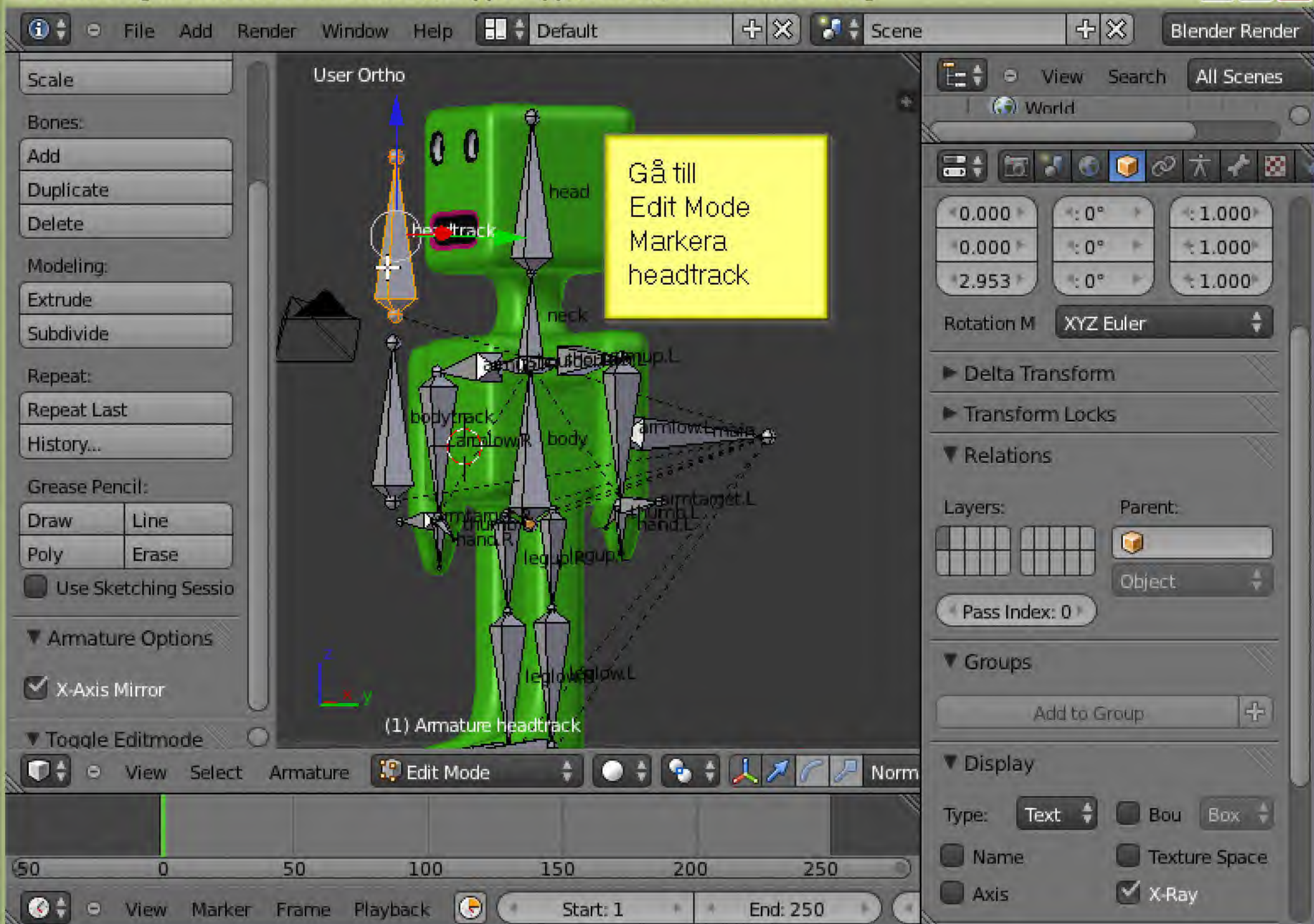
250

End: 250

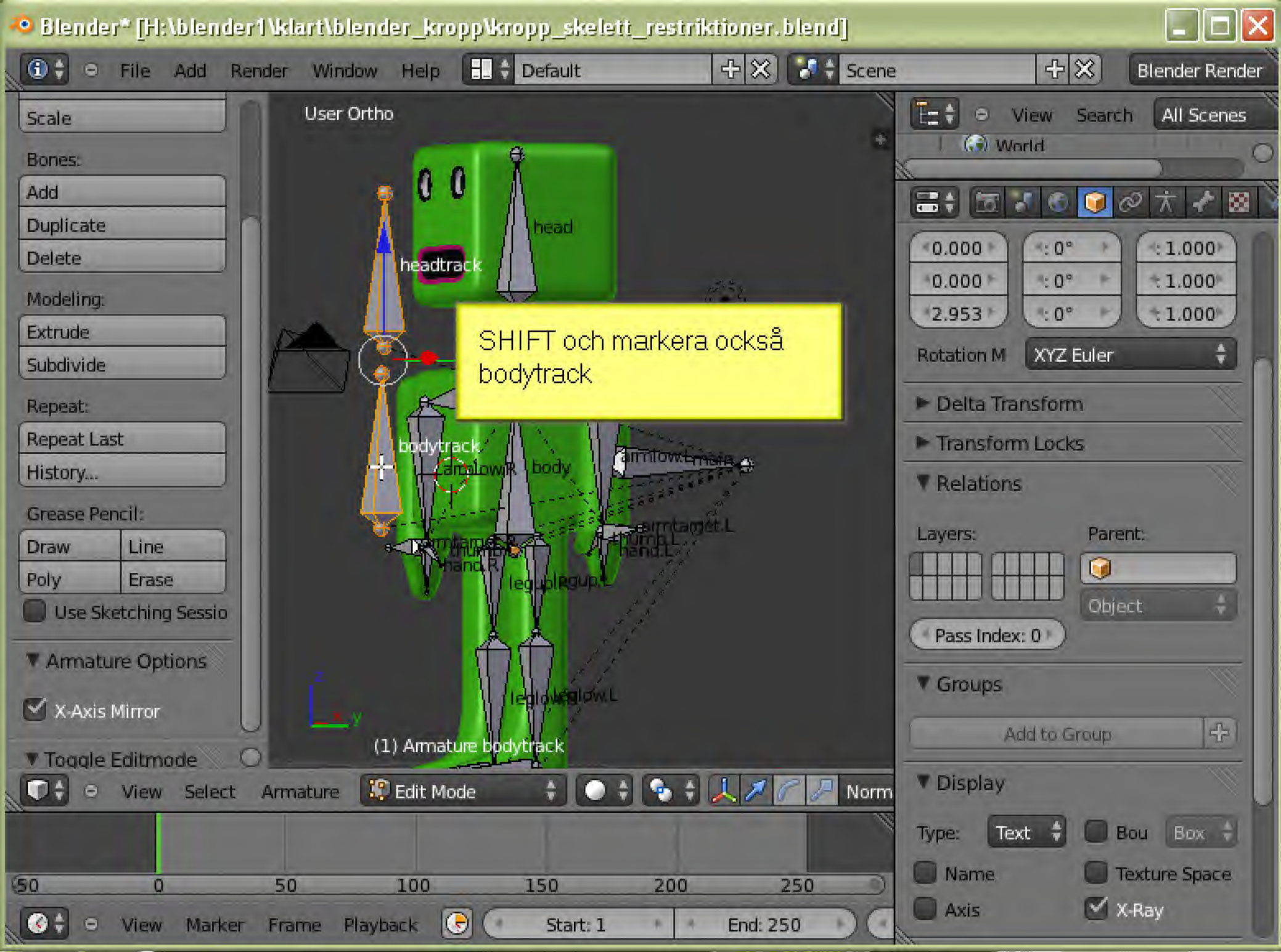










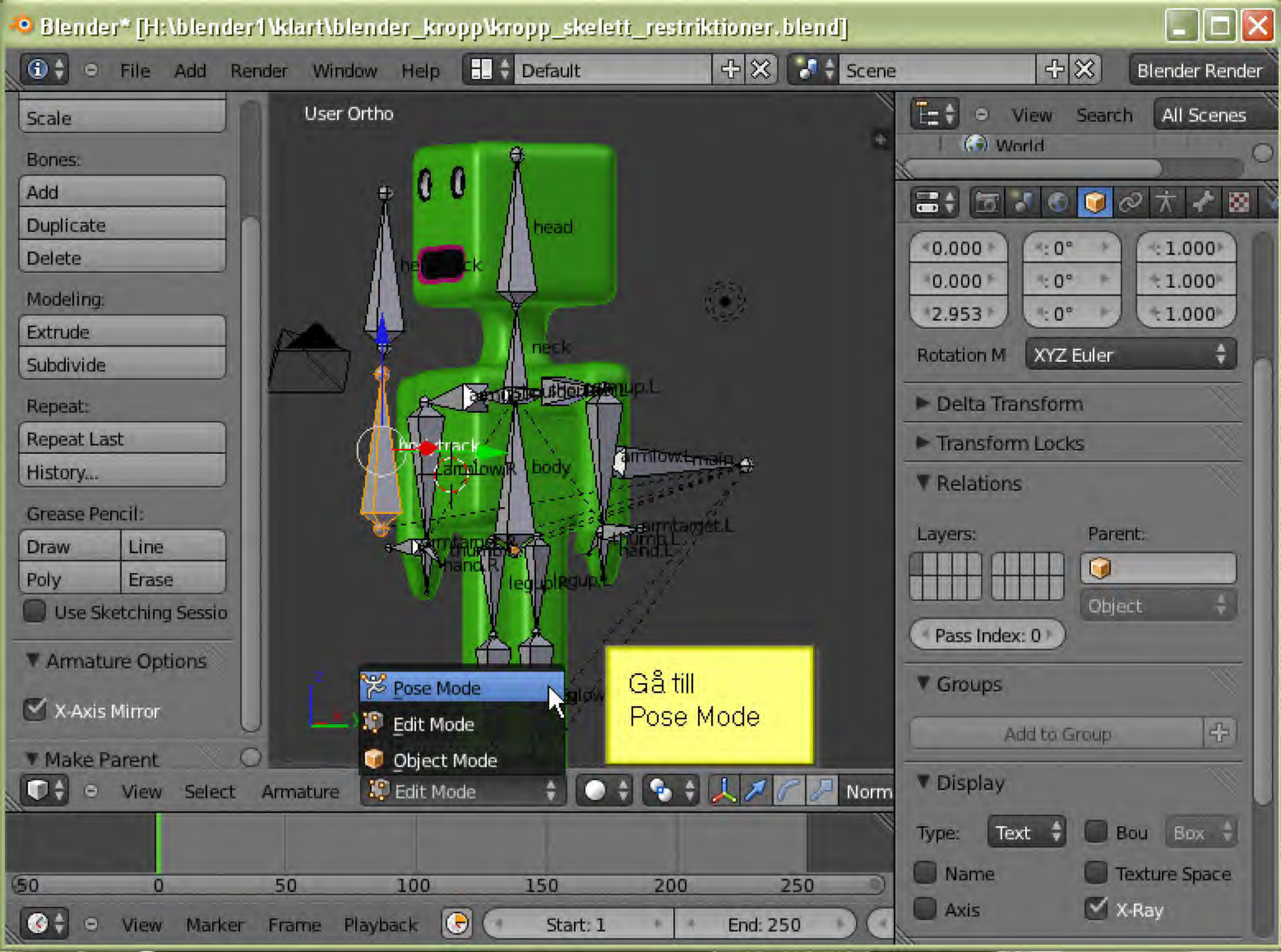




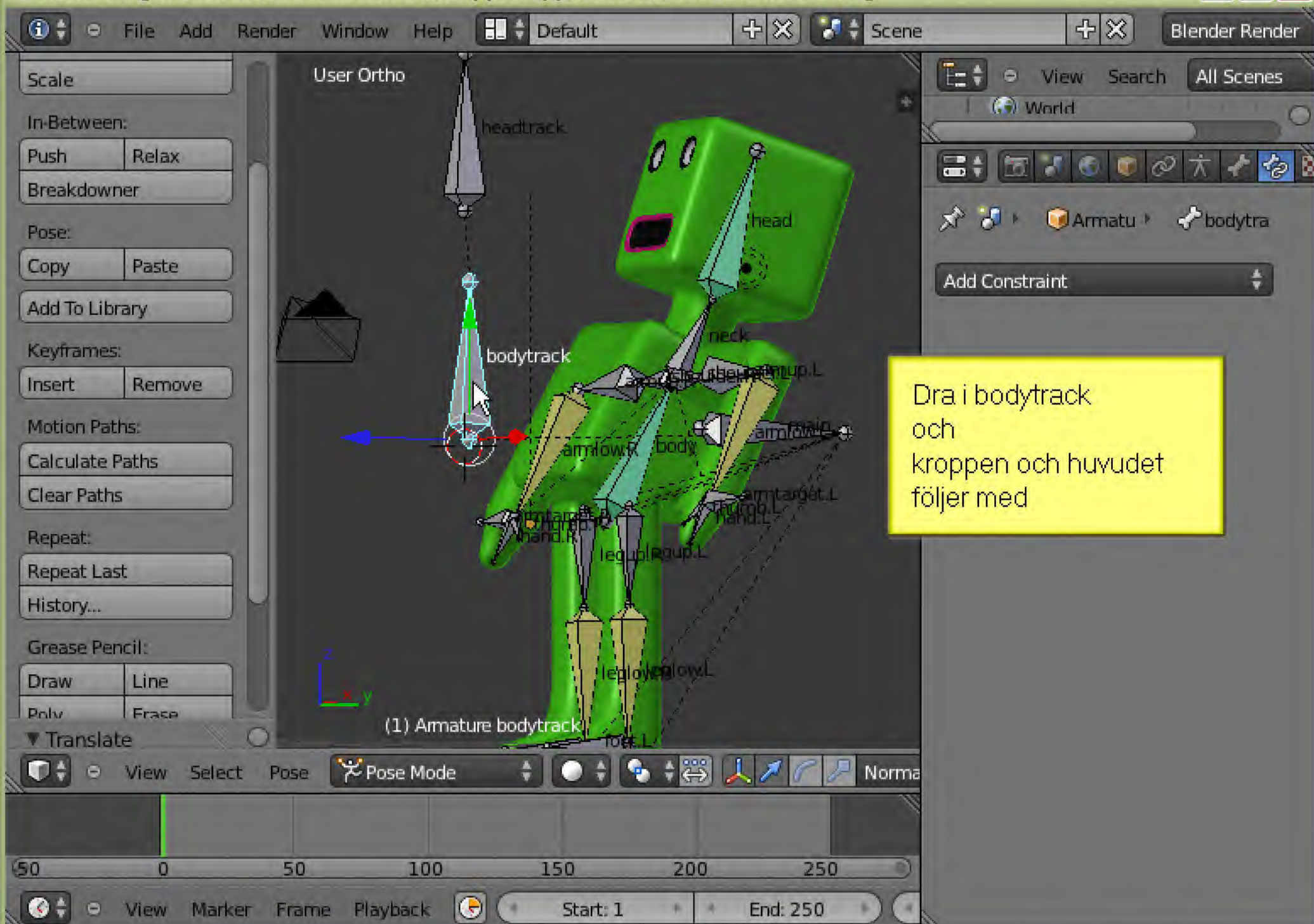
☒ X-Ray

End: 250

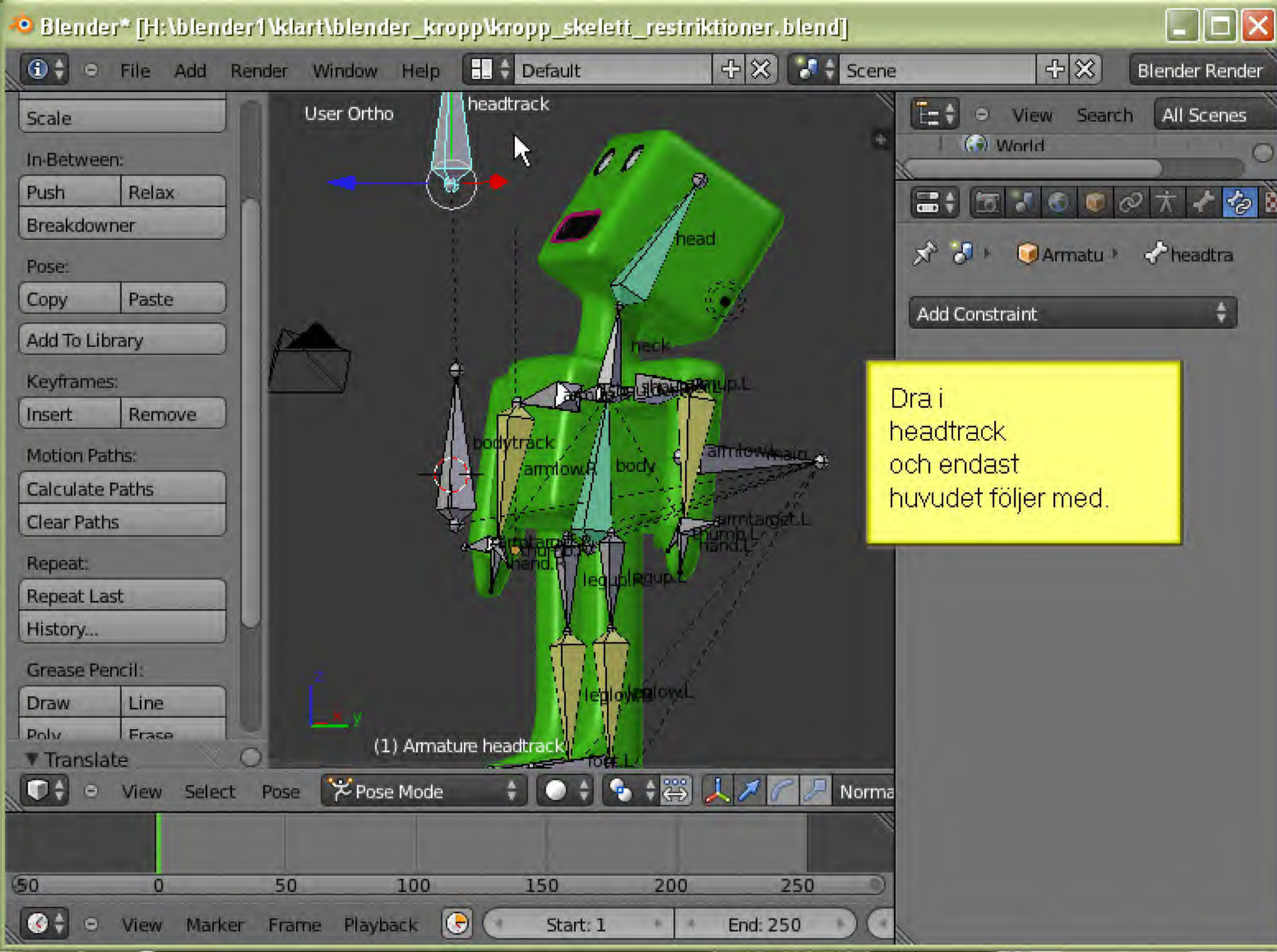




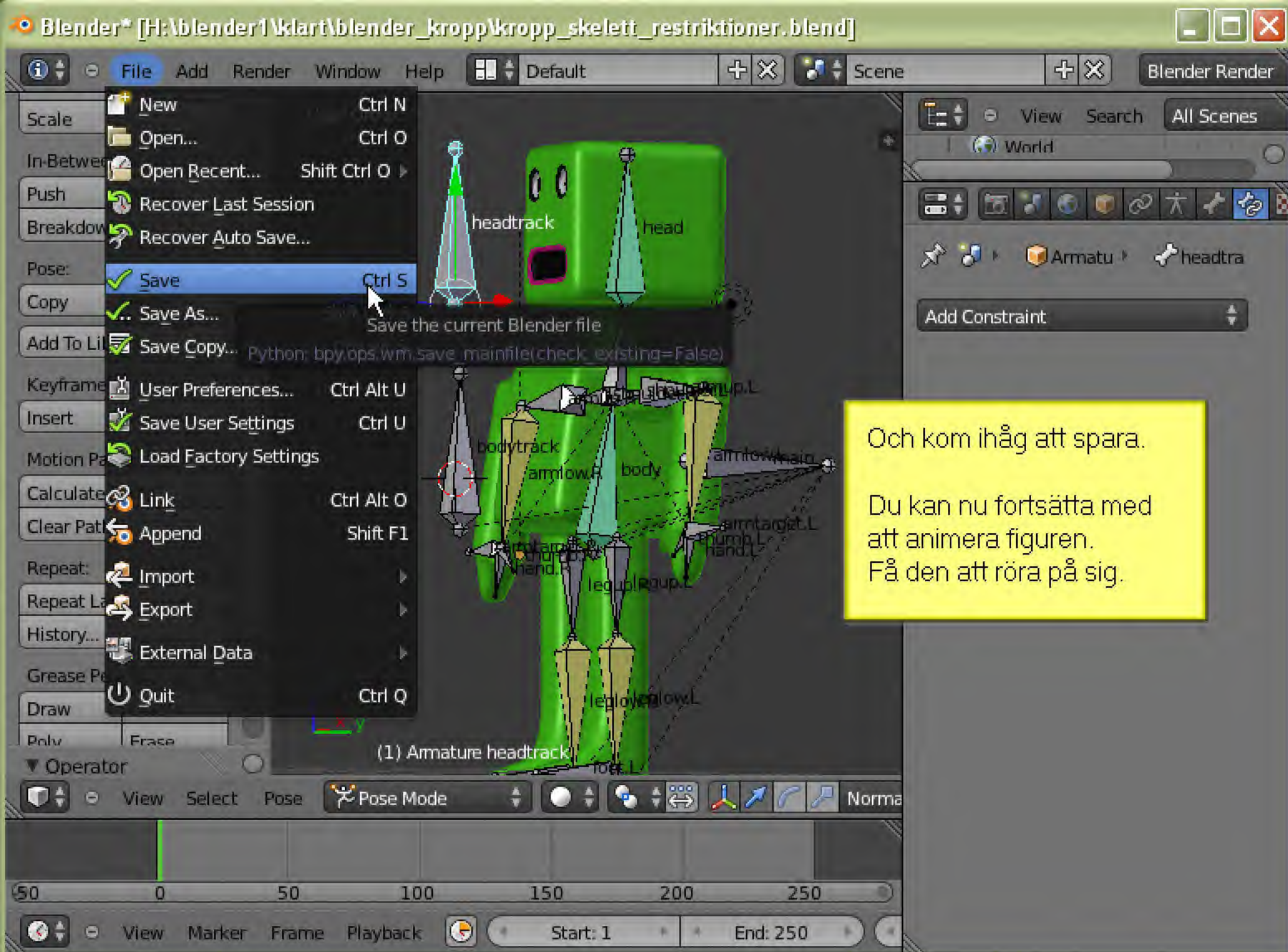




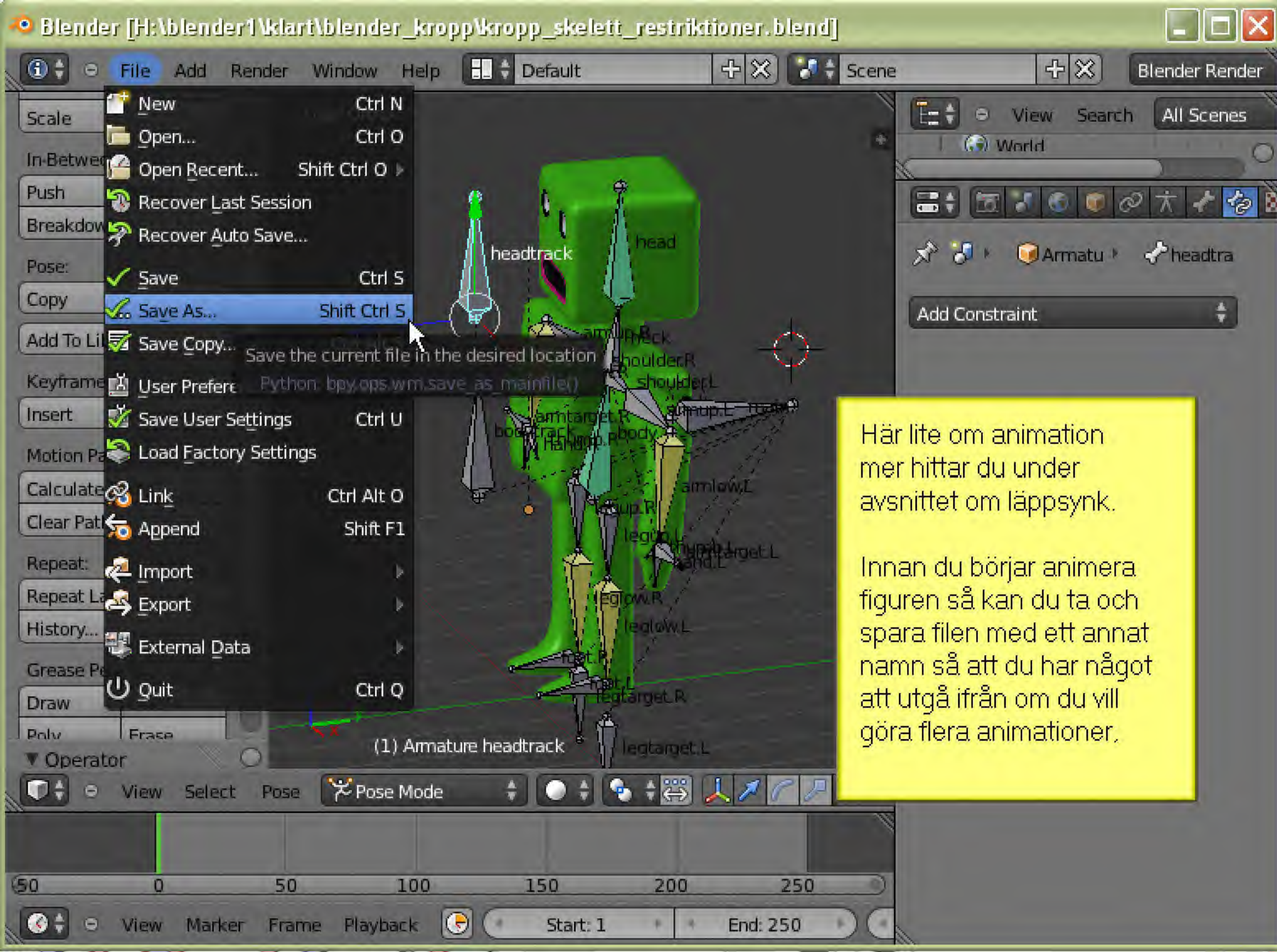




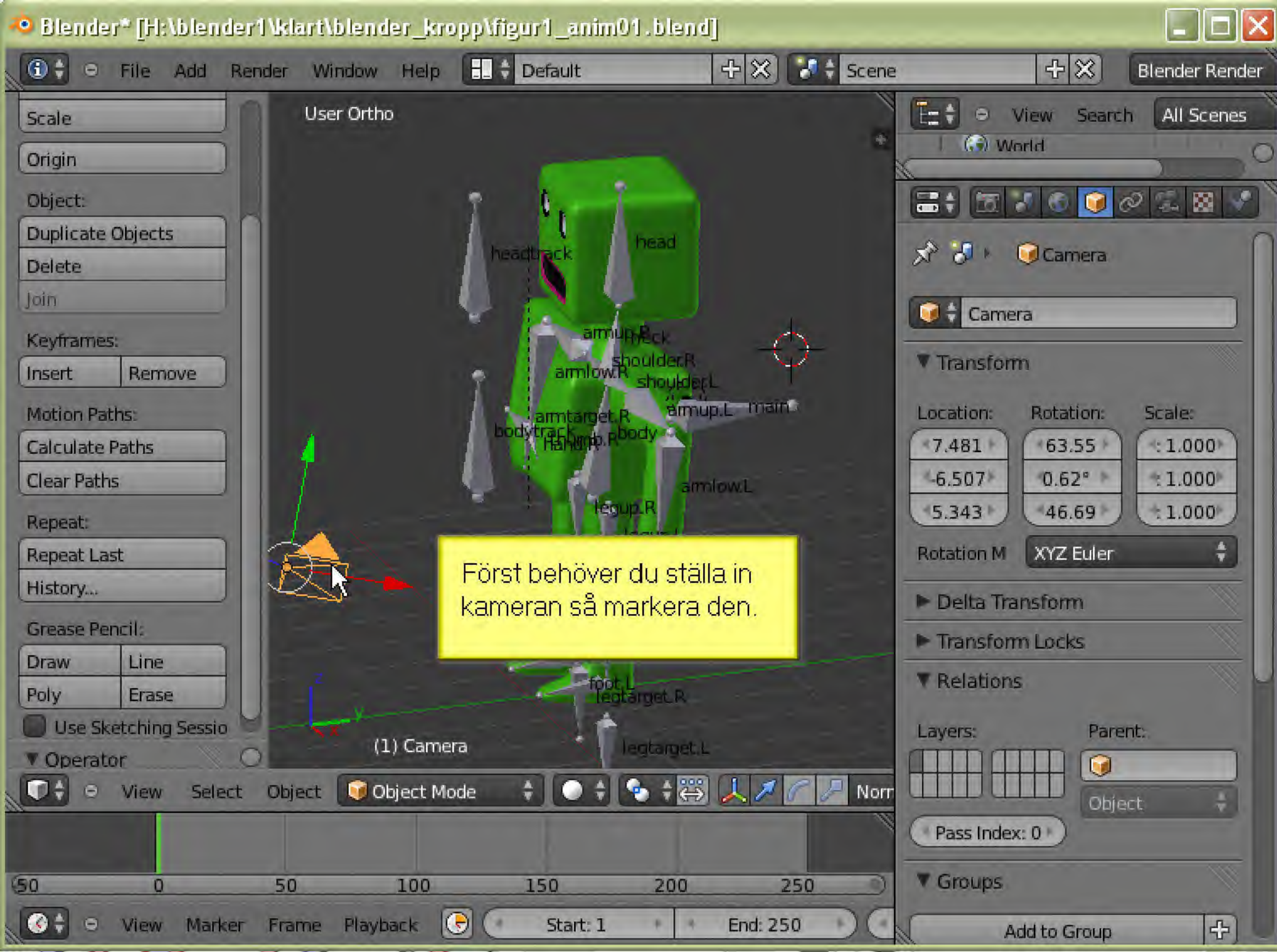




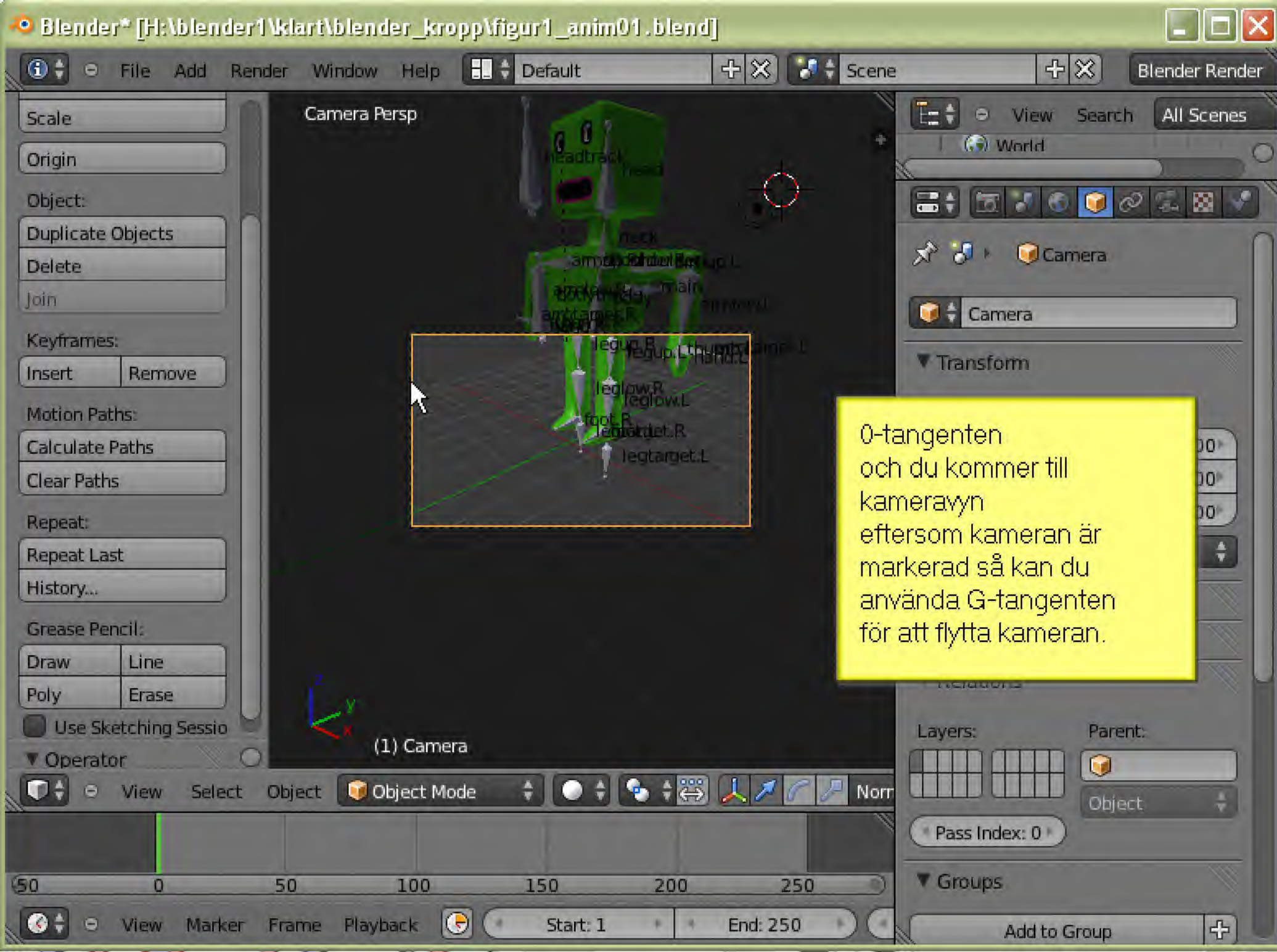




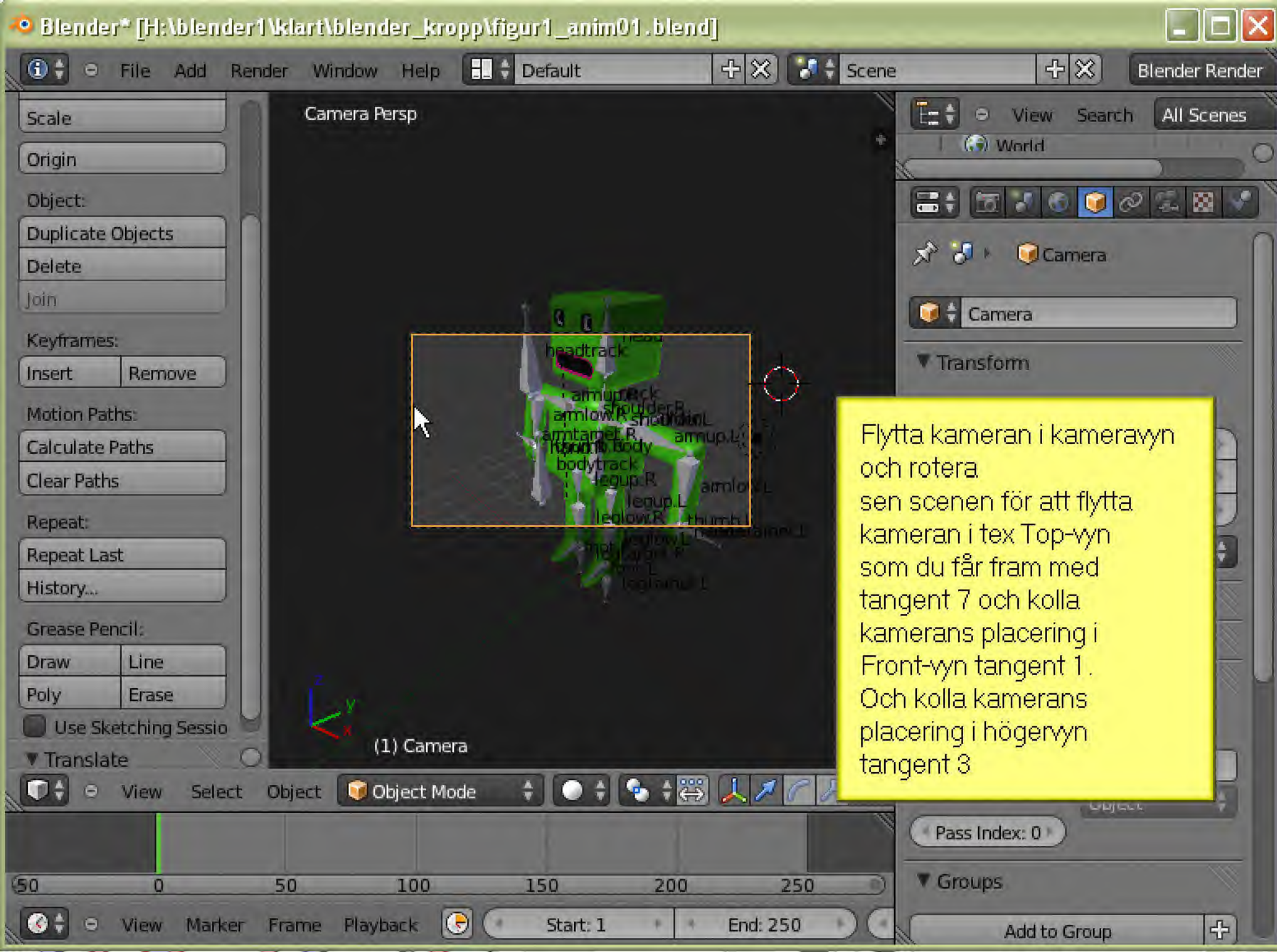














North

End: 250

All Scenes

Camera

1.000

XYZ Euler

## ► Transform Locks

Parent:

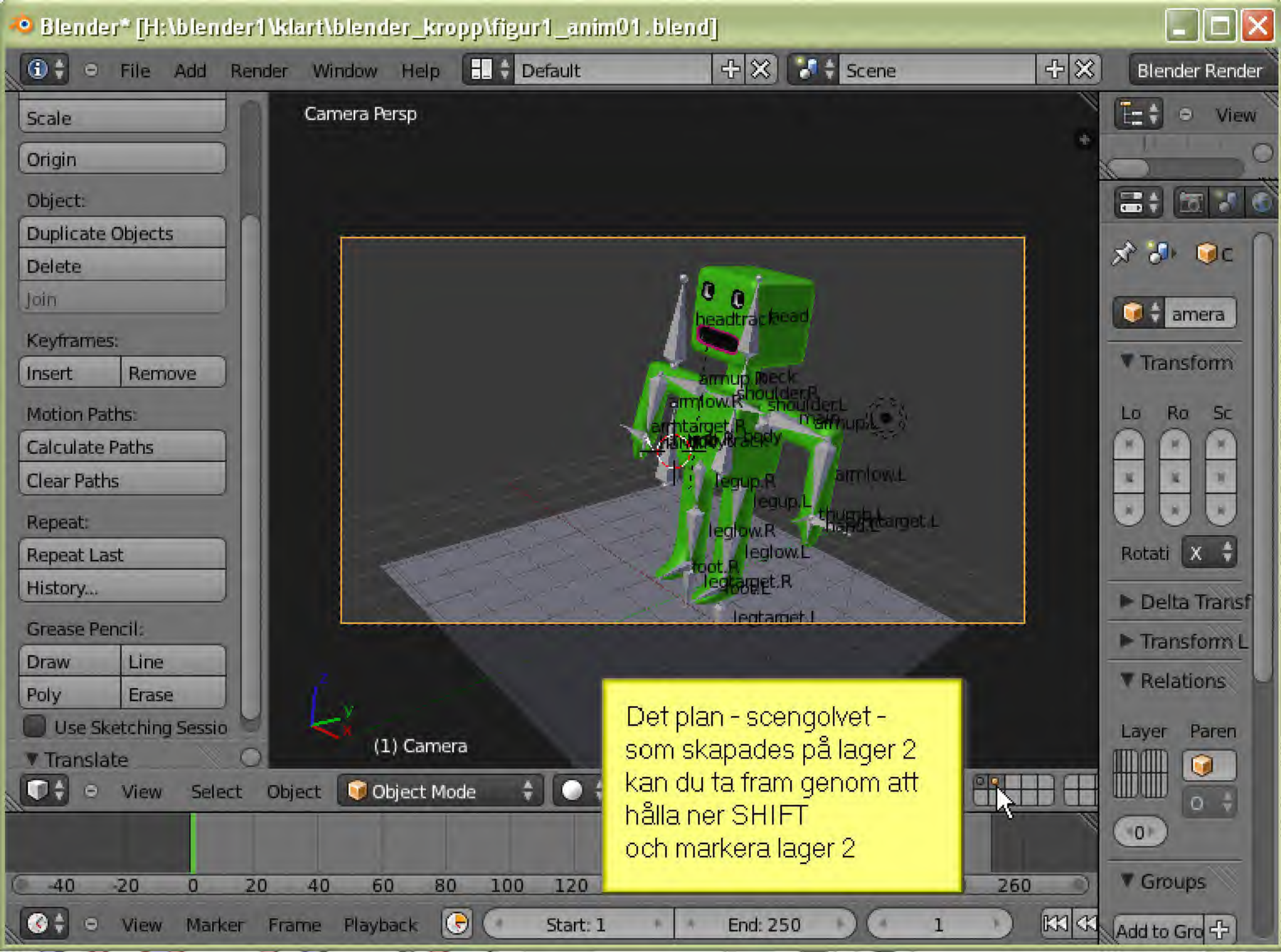
Pass Index: 0

▼ Groups

Add to Group







Scale

Origin

Object:

Duplicate Objects

Delete

Join

Keyframes:

Insert

Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Poly

Erase

Use Sketching Session

Translate

View

Select

Object

Object Mode

Camera Persp

View

amera

Transform

Lo Ro Sc

Rotati X

Delta Transf

Transform L

Relations

Layer Paren

0

Groups

Add to Gro

Det plan - scengolvet -  
som skapades på lager 2  
kan du ta fram genom att  
hålla ner SHIFT  
och markera lager 2

(1) Camera

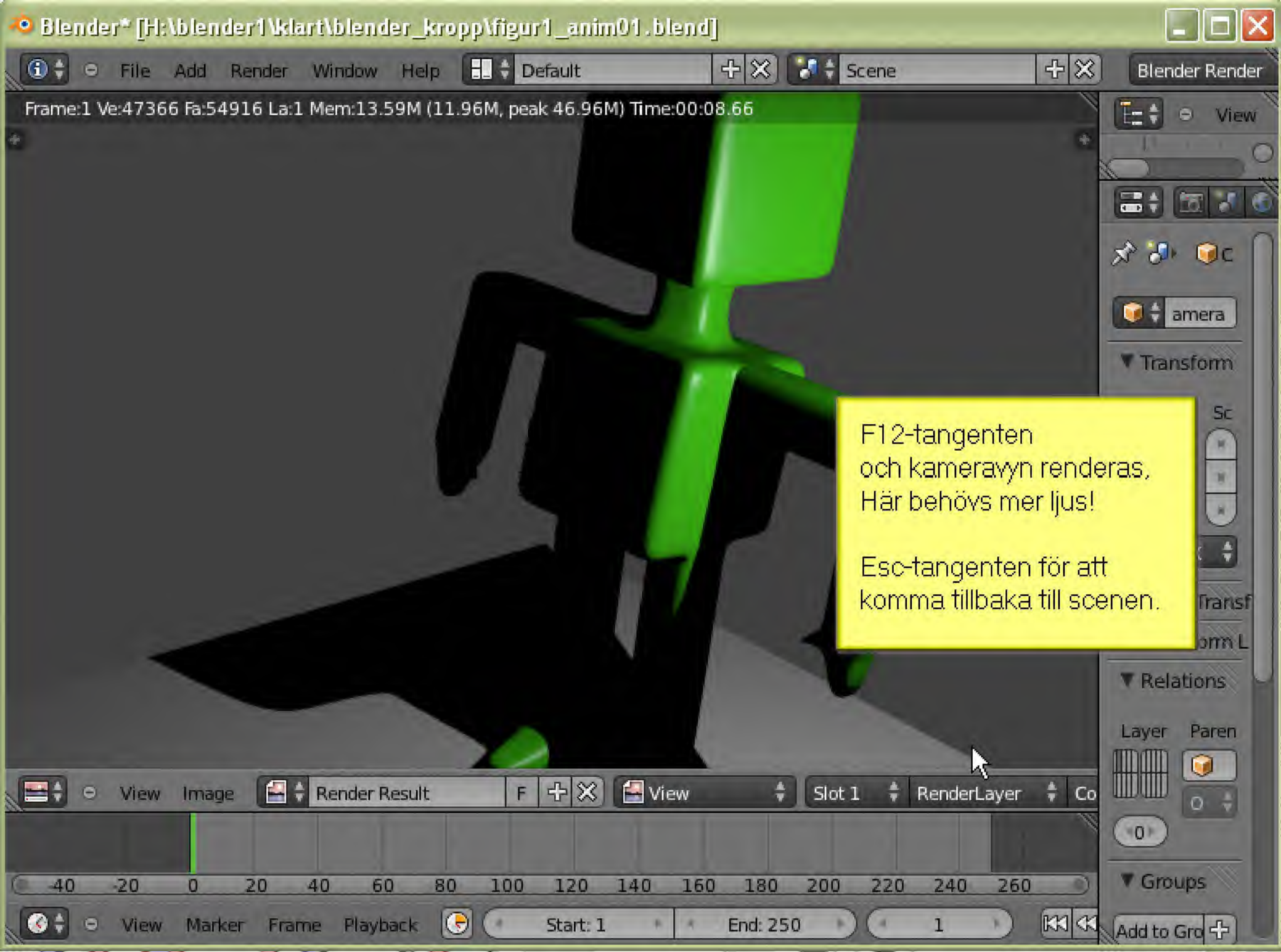
Start: 1

End: 250

1

View Marker Frame Playback

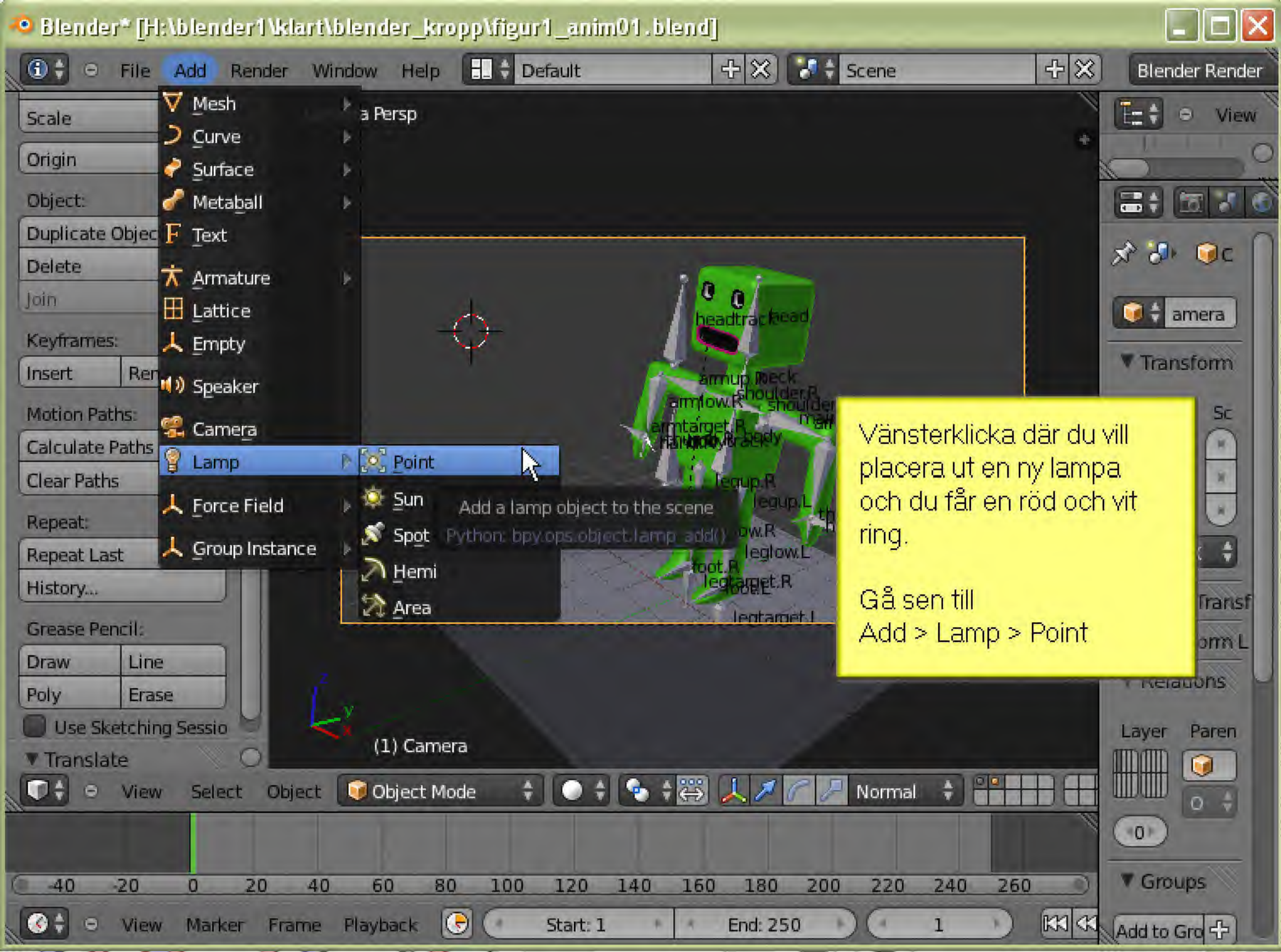




F12-tangenten  
och kameravyn renderas.  
Här behövs mer ljus!

Esc-tangenten för att  
komma tillbaka till scenen.





Scale

Origin

Object:

Duplicate Object

Delete

Join

Keyframes:

Insert

Render

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Poly

Erase

Use Sketching Session

Translate

View

Select

Object

Object Mode

Normal

Normal

-40

-20

0

20

40

60

80

100

120

140

160

180

200

220

240

260

View

Marker

Frame

Playback

Start: 1

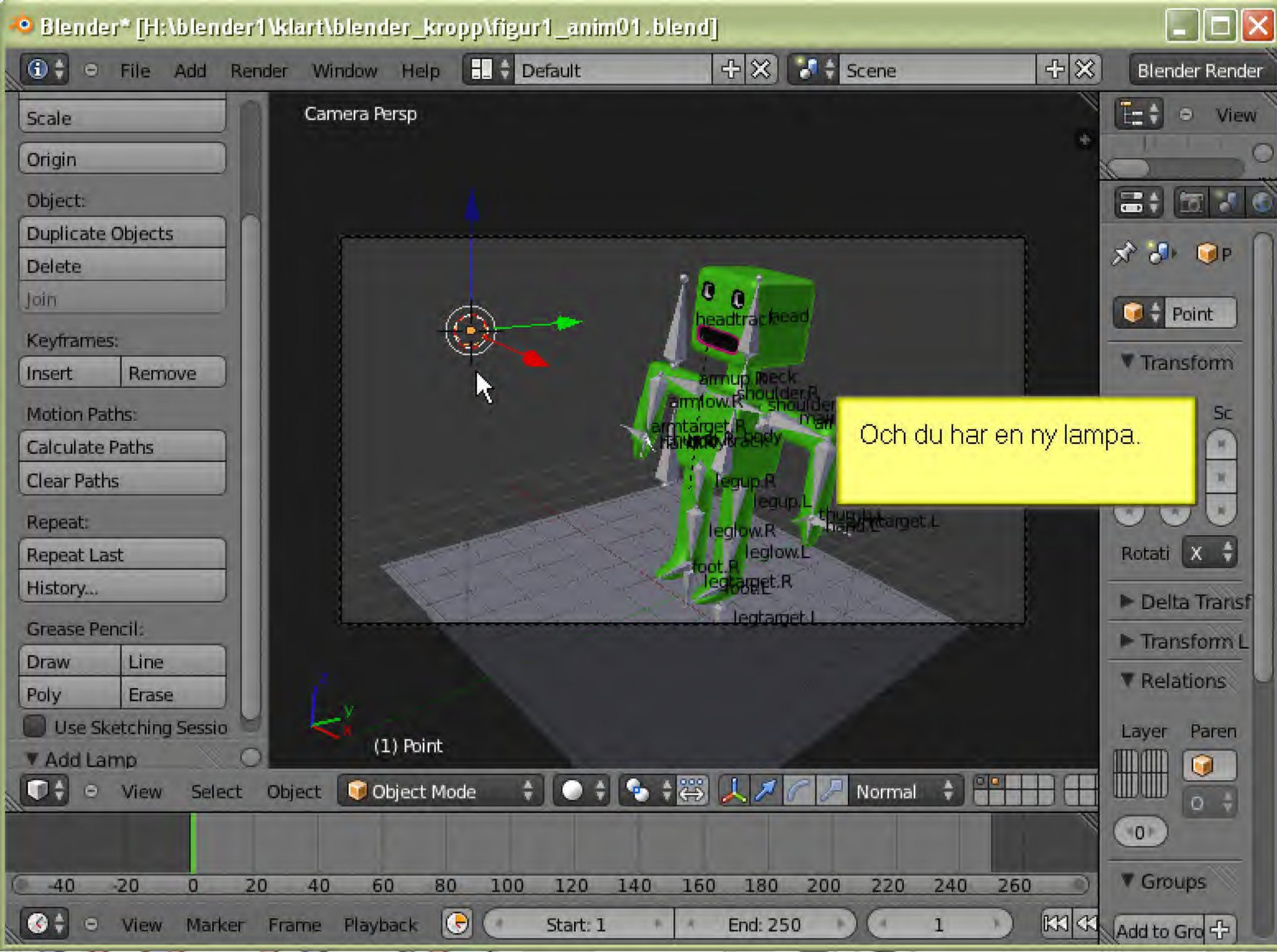
End: 250

1

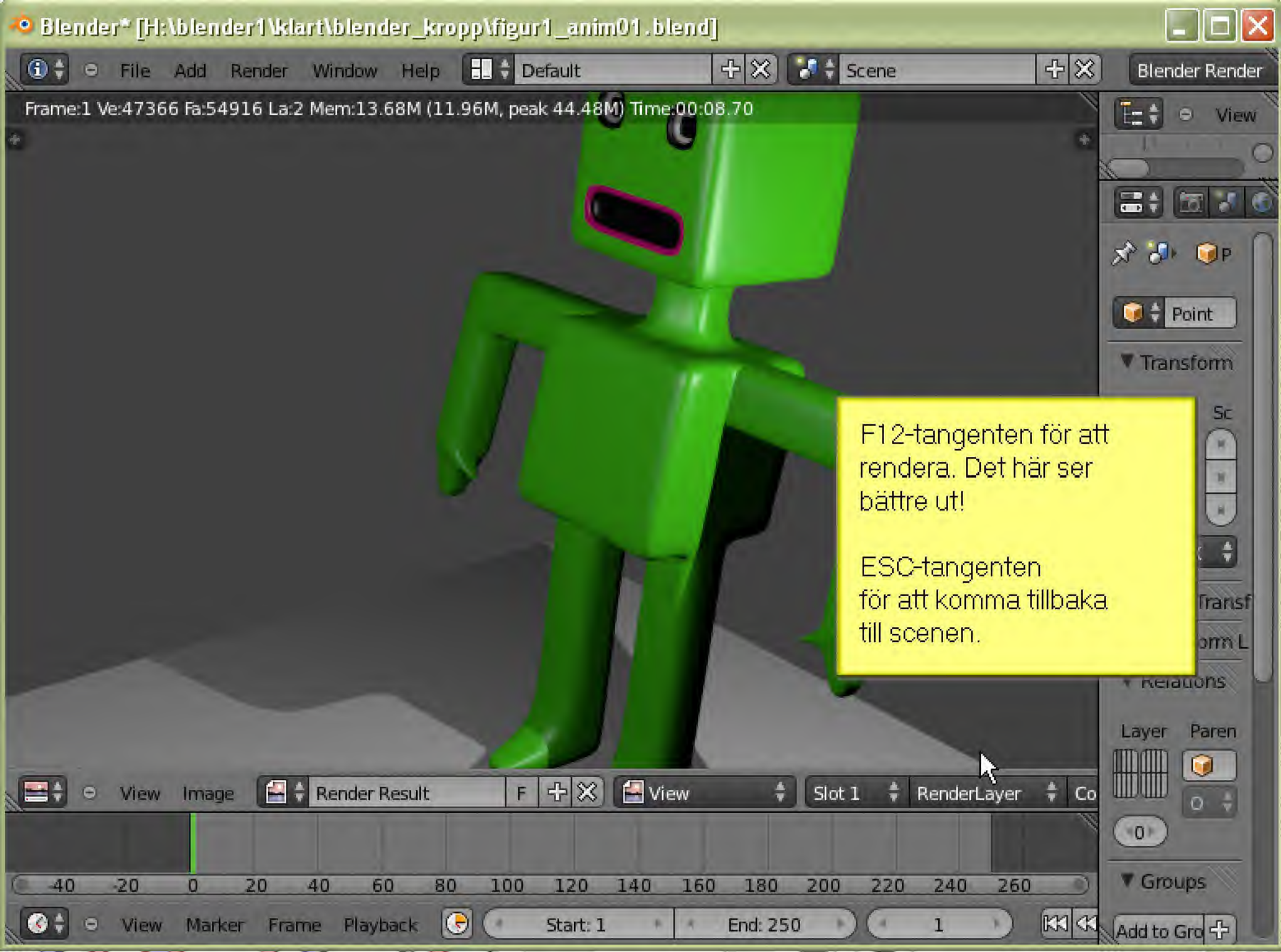
Vänsterklicka där du vill placera ut en ny lampa och du får en röd och vit ring.

Gå sen till  
Add > Lamp > Point









F12-tangenten för att rendera. Det här ser bättre ut!

ESC-tangenten för att komma tillbaka till scenen.

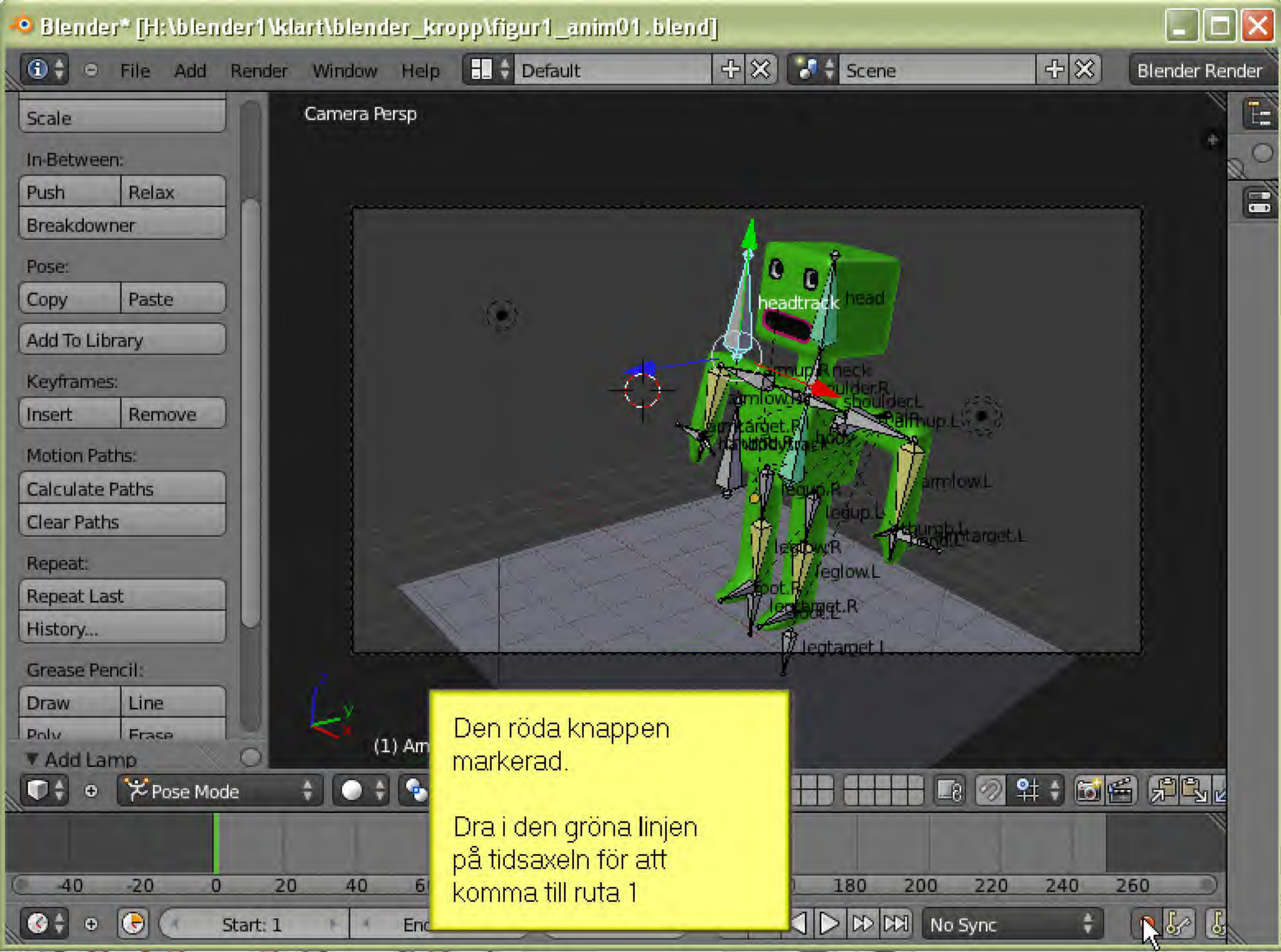












Den röda knappen markerad.

Dra i den gröna linjen på tidsaxeln för att komma till ruta 1





File

Add

Render

Window

Help



Default



Scene



Blender Render

Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

Add To Library

Keyframes:

Insert

Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Poly

Frame

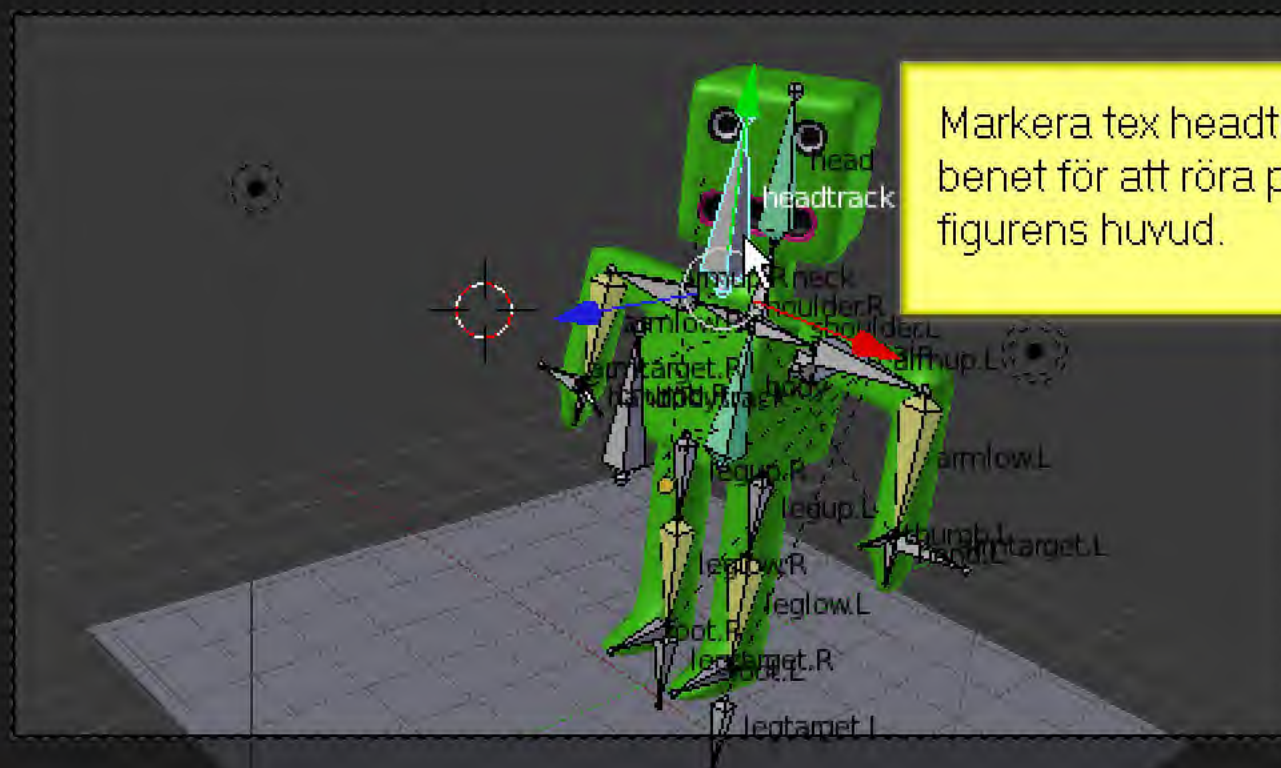
▼ Translate



Pose Mode



Camera Persp



Markera tex headtrack-  
benet för att röra på  
figurens huvud.



(1) Armature headtrack



Pose Mode



-40

-20

0

20

40

60

80

100

120

140

160

180

200

220

240

260



Start: 1

End: 250

1

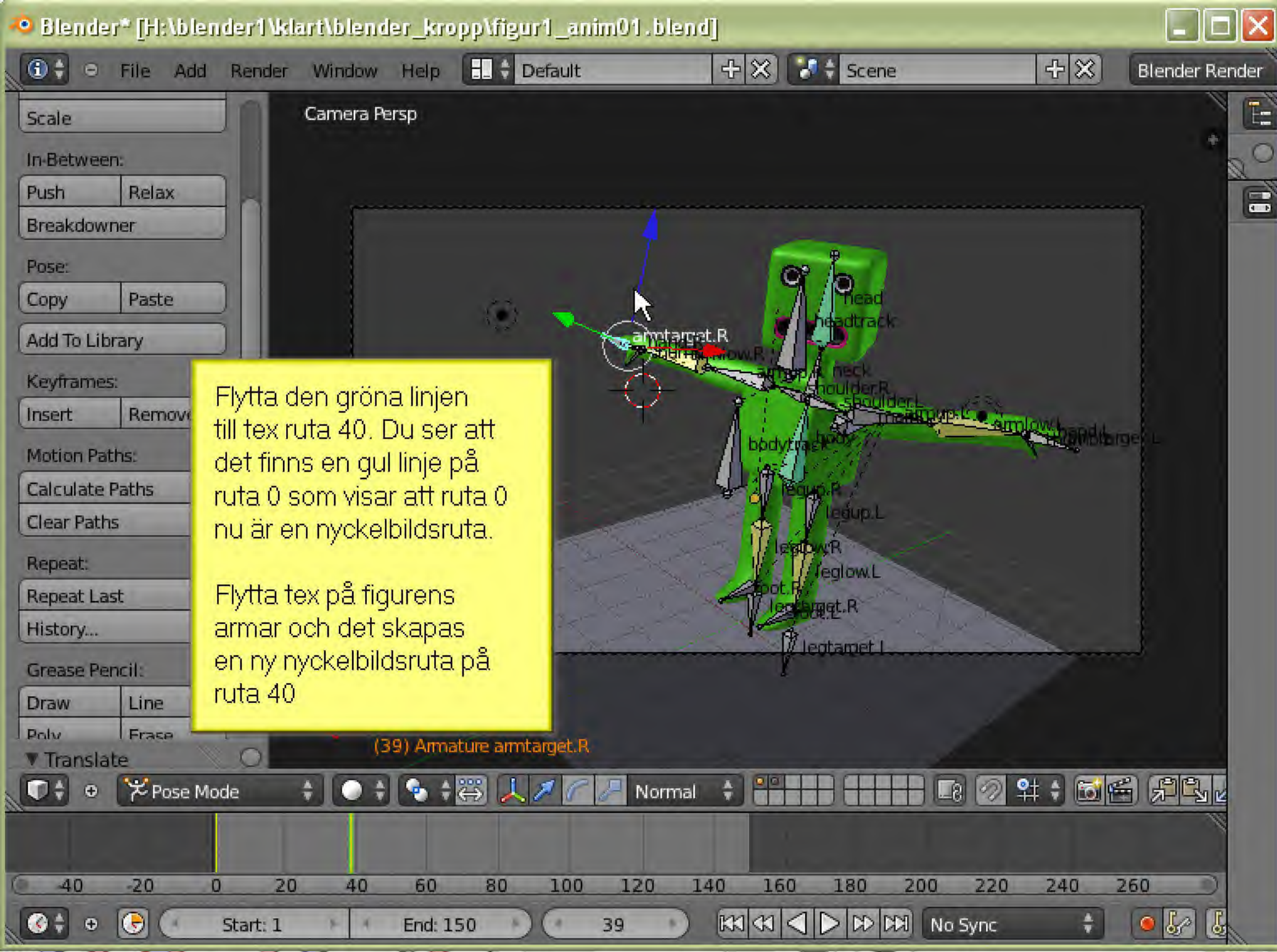


No Sync











Scale

In-Between:

Push

Relax

Breakdowner

Pose:

Copy

Paste

Add To Library

Keyframes:

Insert

Remove

Motion Paths:

Calculate Paths

Clear Paths

Repeat:

Repeat Last

History...

Grease Pencil:

Draw

Line

Poly

Frame

▼ Translate



Pose Mode



Normal



Fortsätt med att skapa en nyckelbildsruta på tex ruta 100 genom att röra på figuren på något sätt.

Och sen en nyckelbildsruta på den sista rutan - ruta 150.

(149) Armature armtarget.R

40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260



Start: 1

End: 150

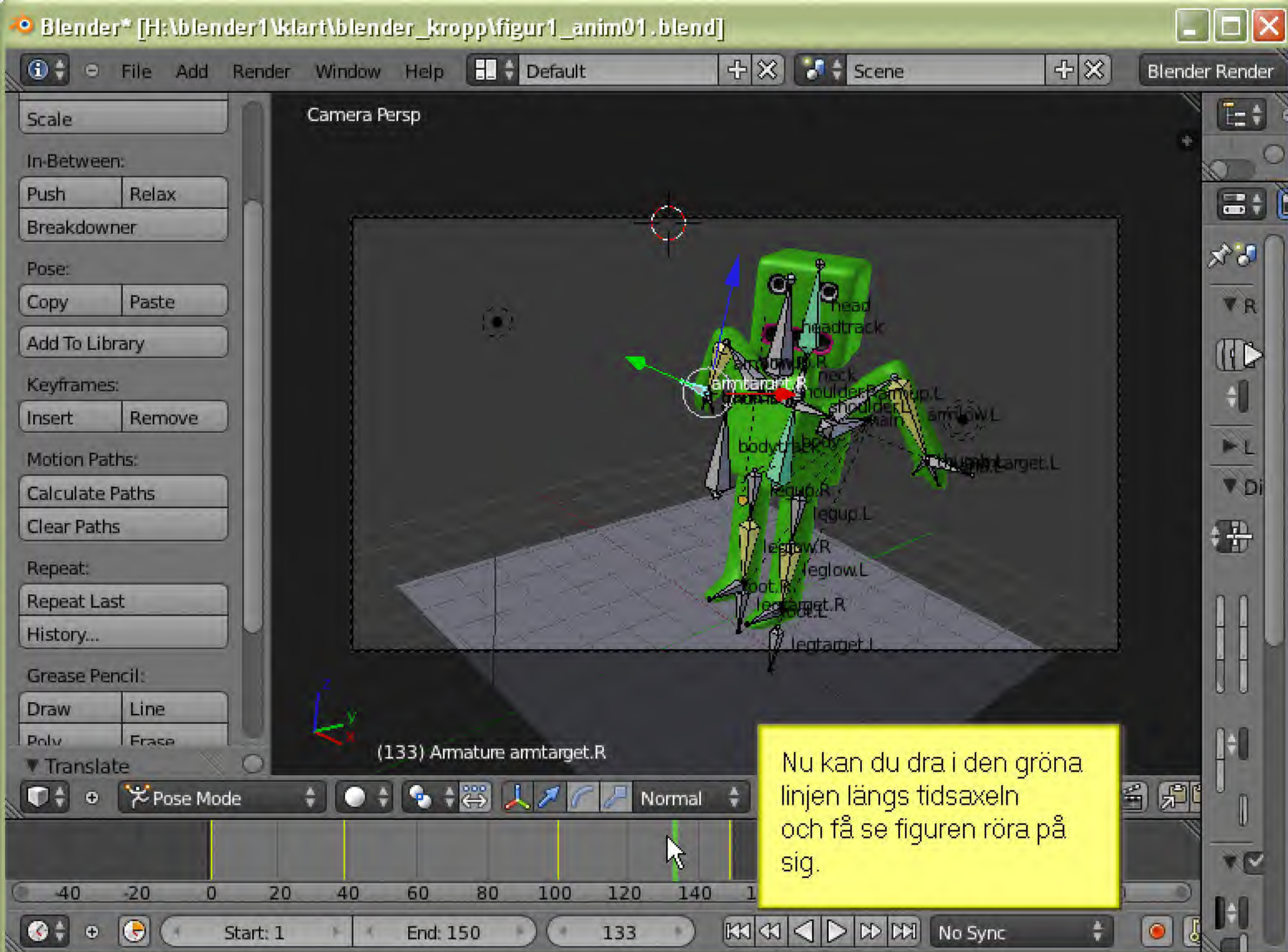
149



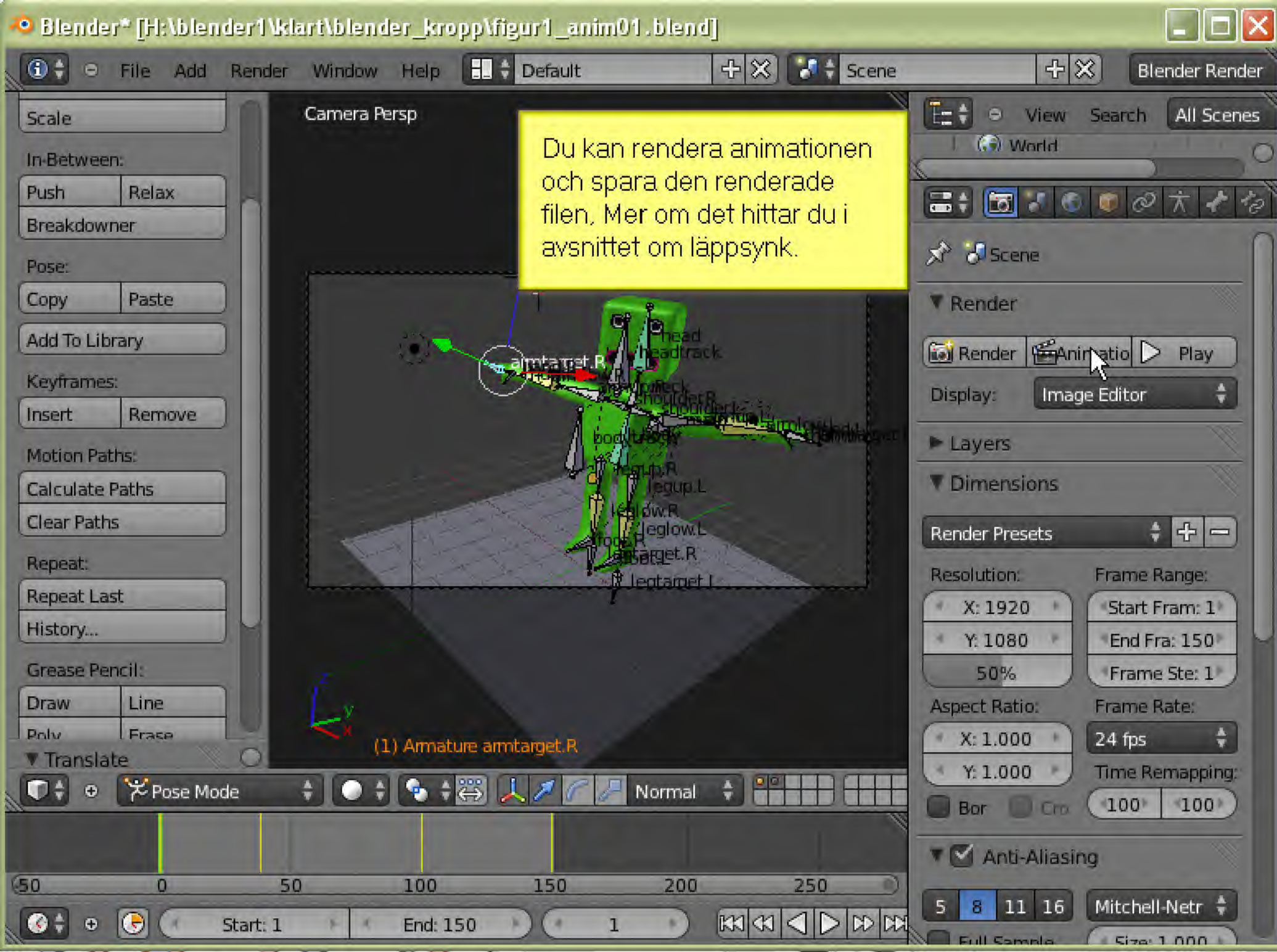
No Sync



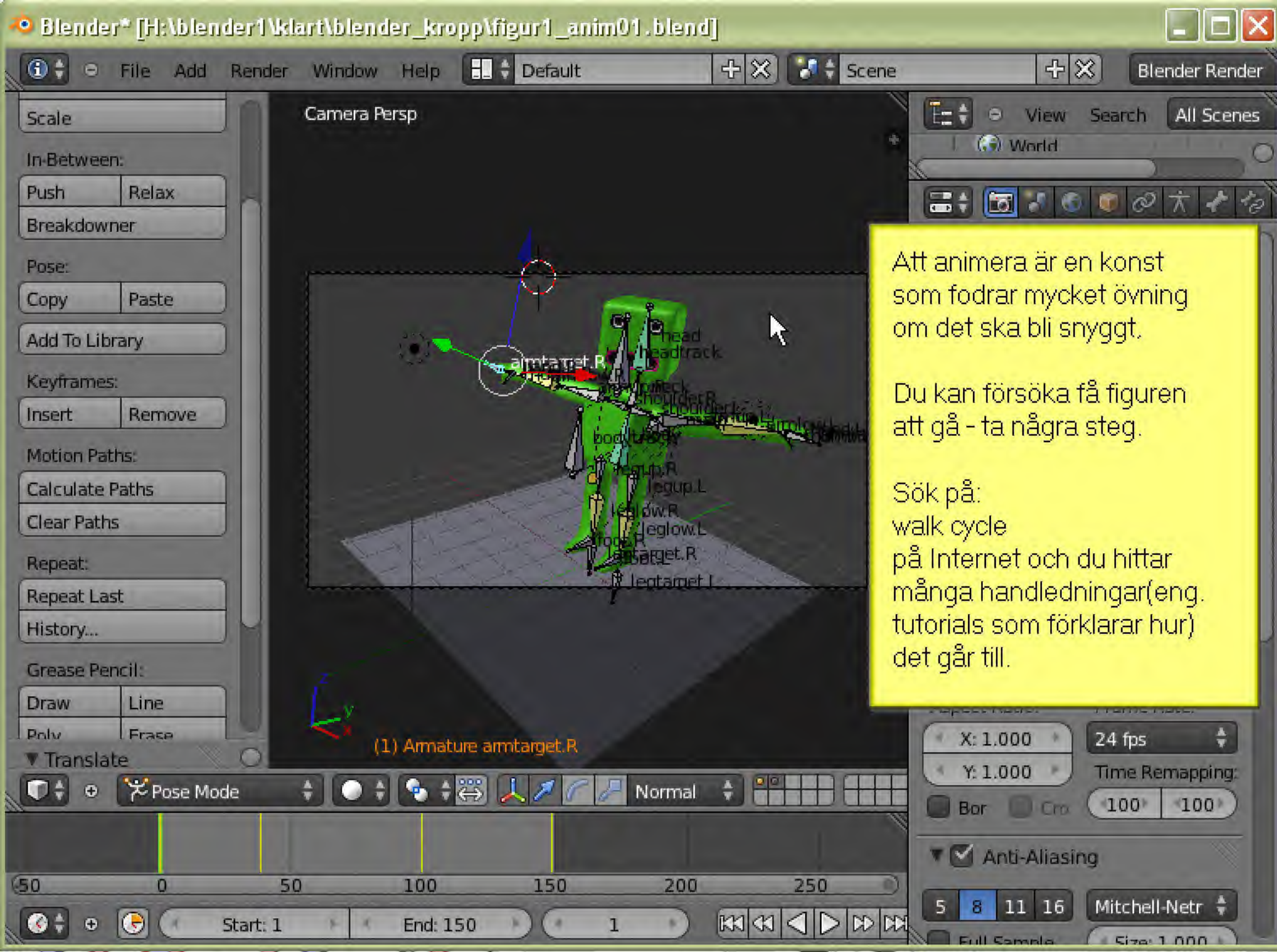




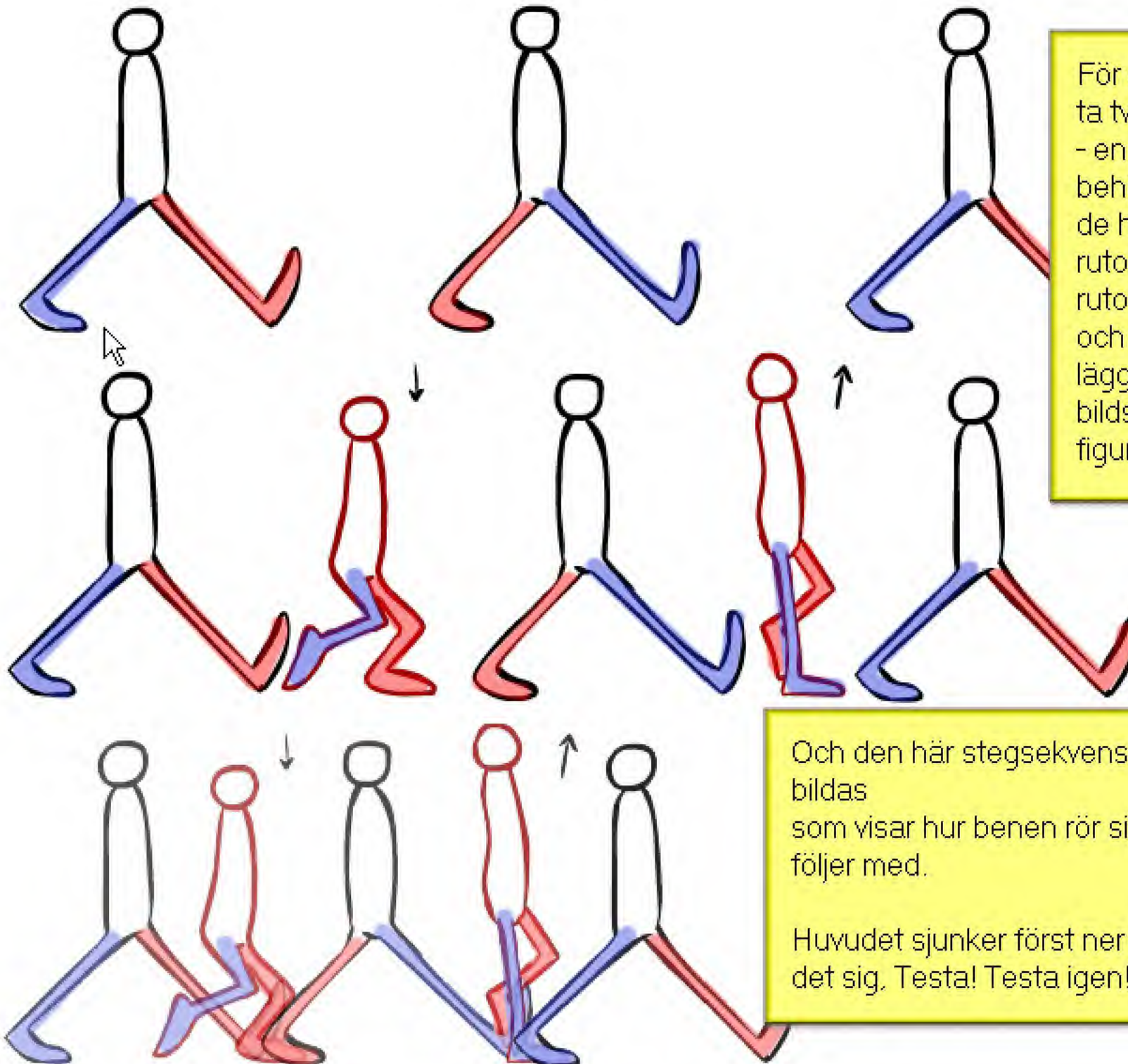










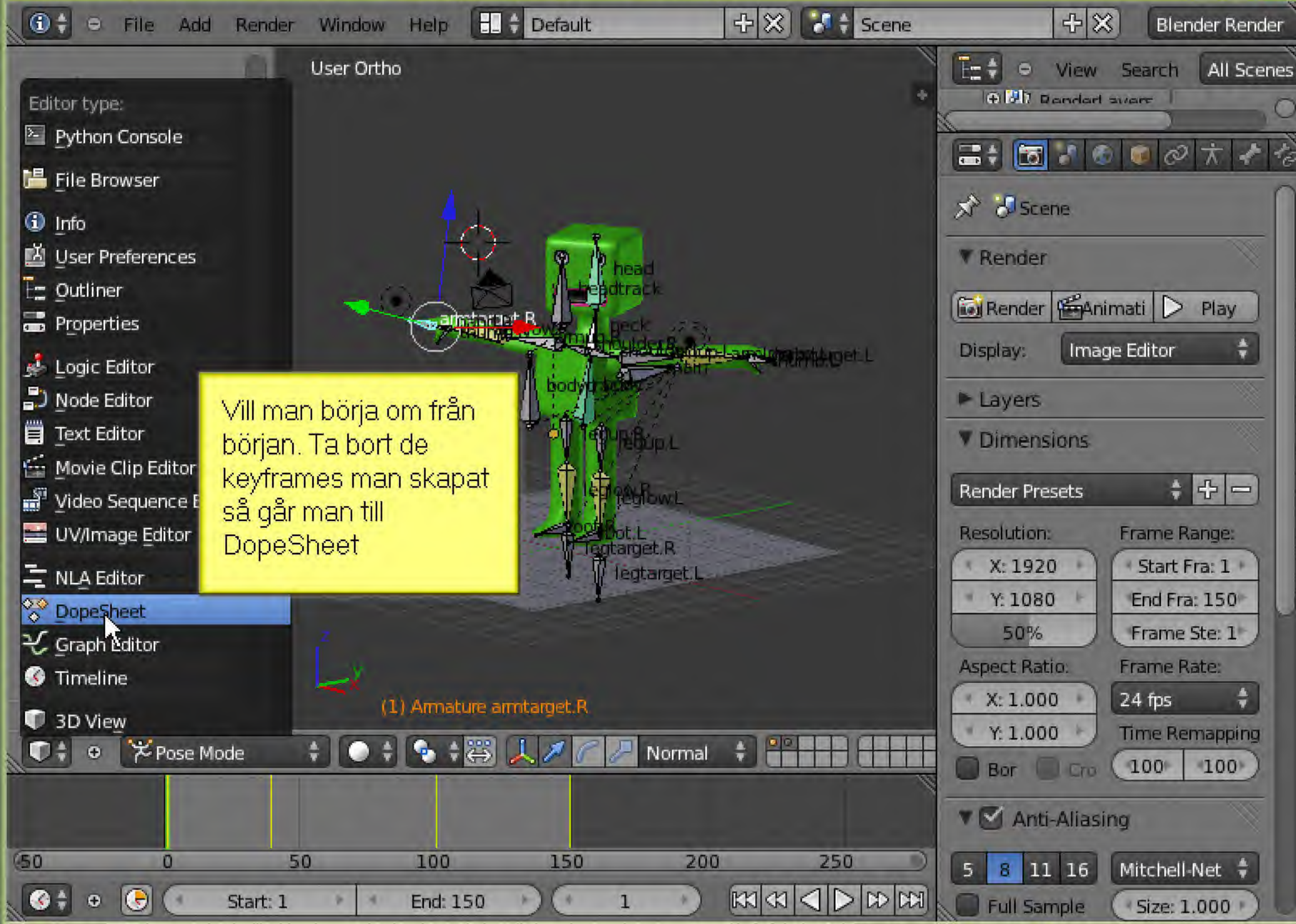


För att få figuren att ta två steg - en walk cycle - så behöver du skapa de här tre nyckelbilds-rutorna med ett antal rutors mellanrum och sen mellan dessa lägga in två nyckel-bildsrutor som visar hur figuren kliver framåt.

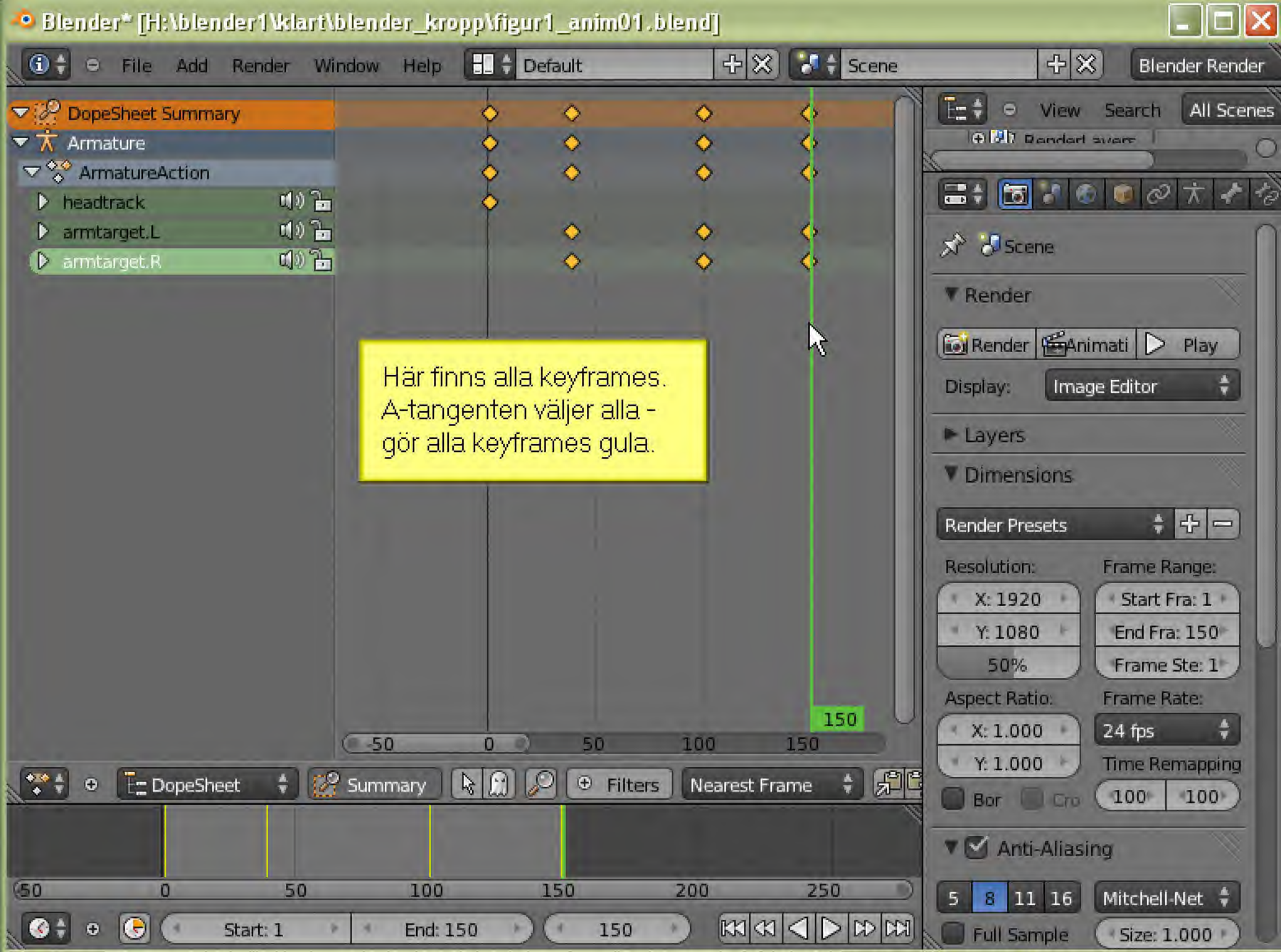
Och den här stegsekvensen kommer att bildas som visar hur benen rör sig och kroppen följer med.

Huvudet sjunker först ner och sen höjer det sig. Testa! Testa igen! Och igen!

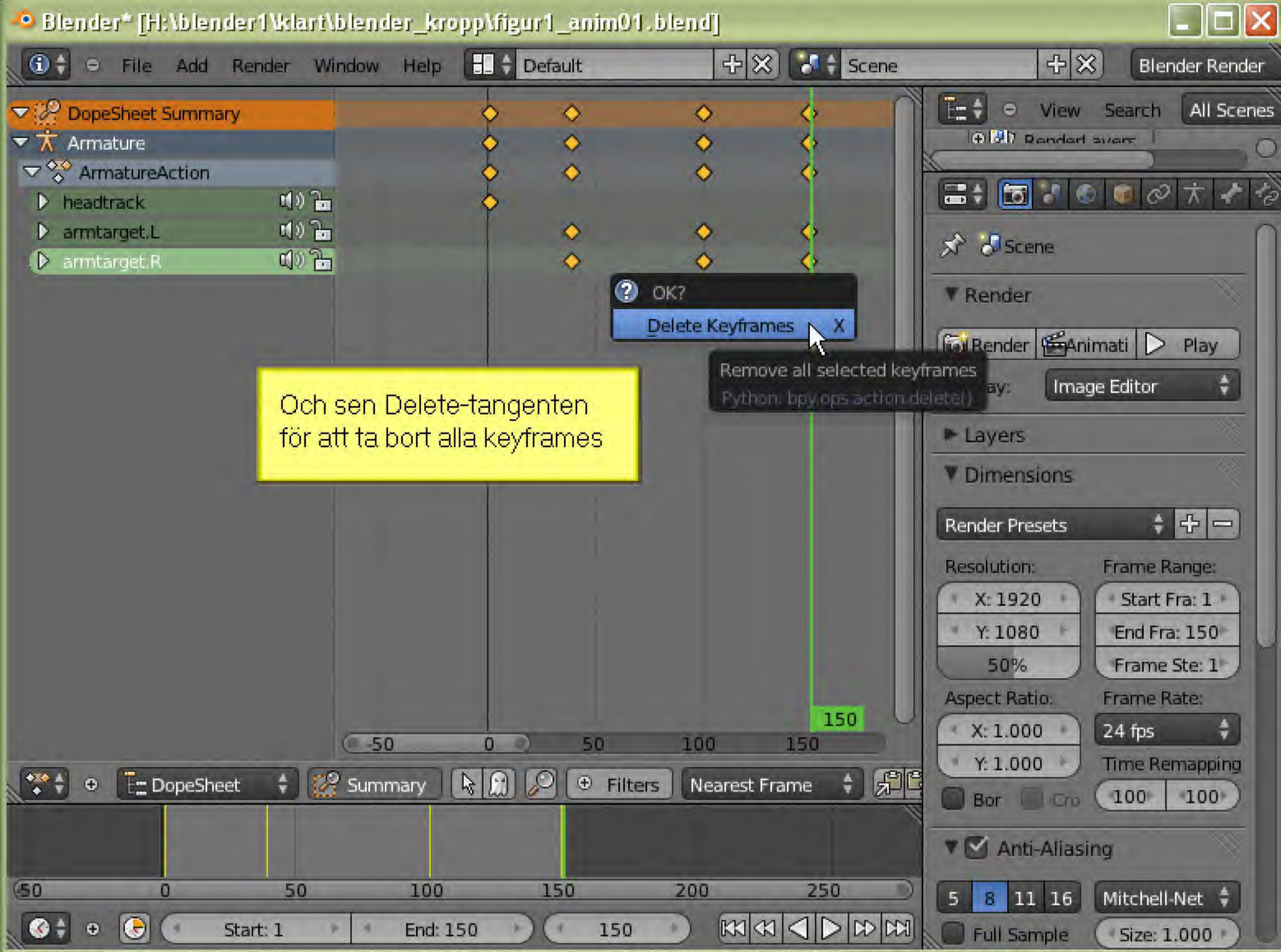










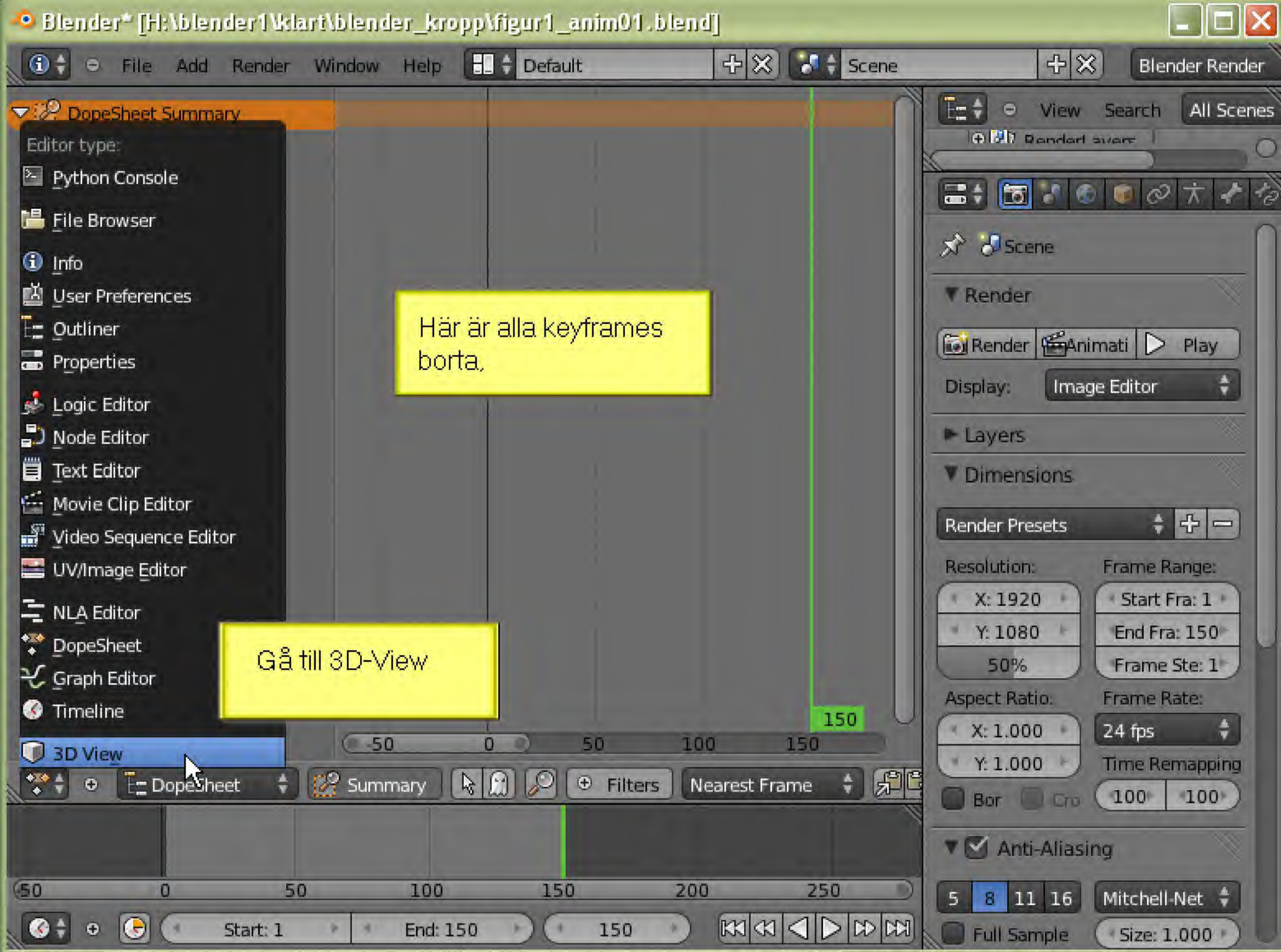


Och sen Delete-tangenten  
för att ta bort alla keyframes

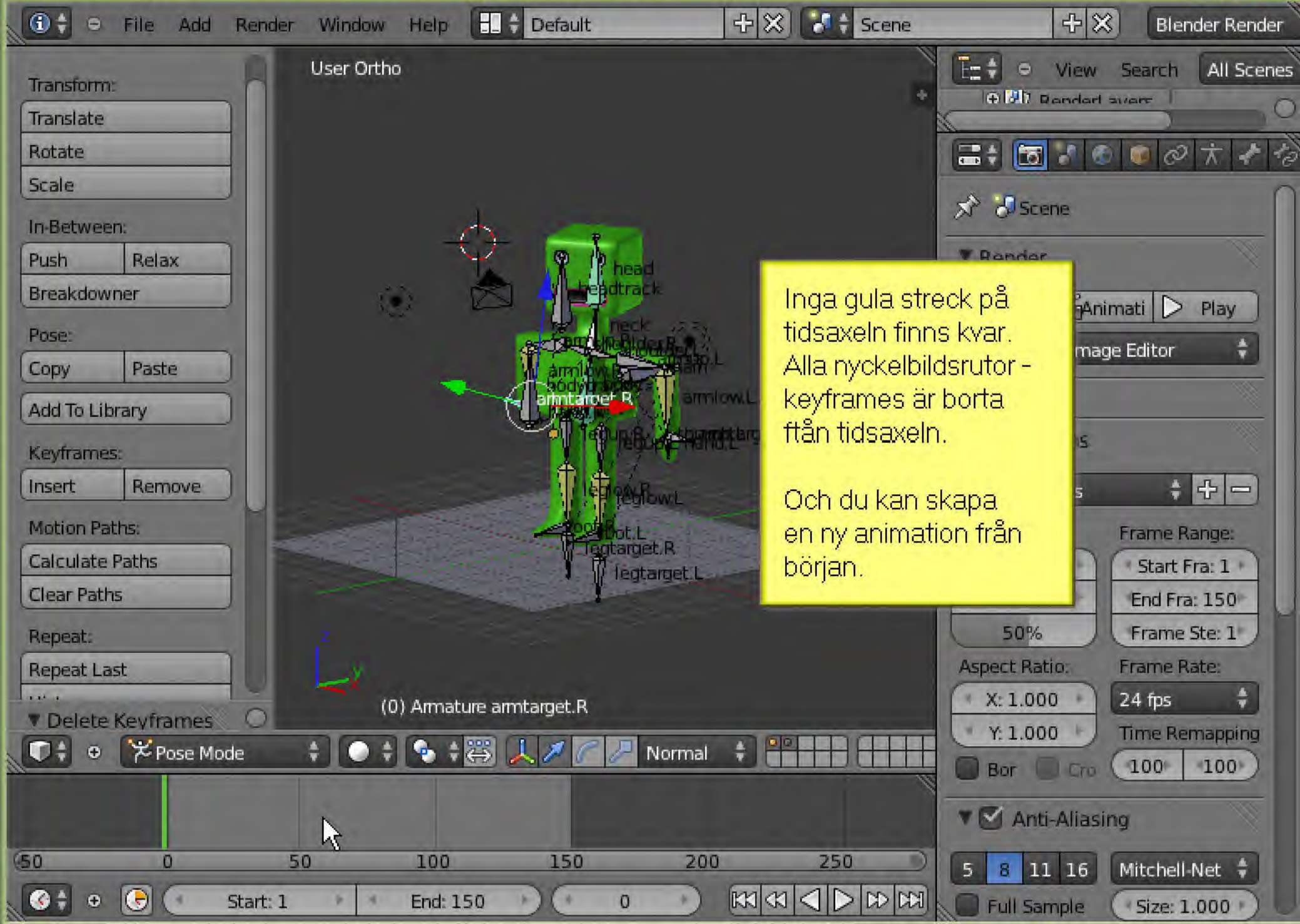
? OK?  
Delete Keyframes X

Remove all selected keyframes  
Python: bpy.ops.action.delete()

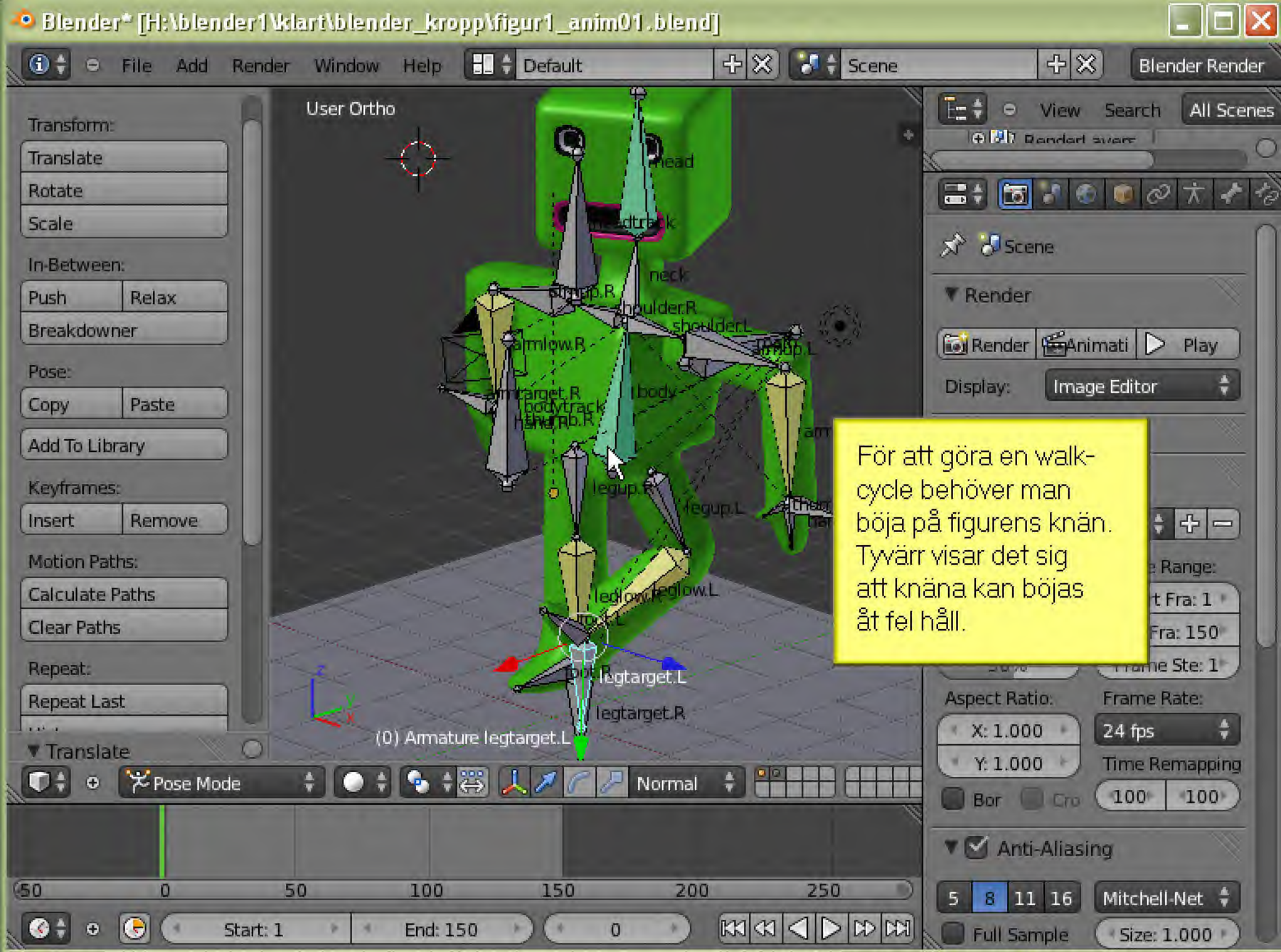










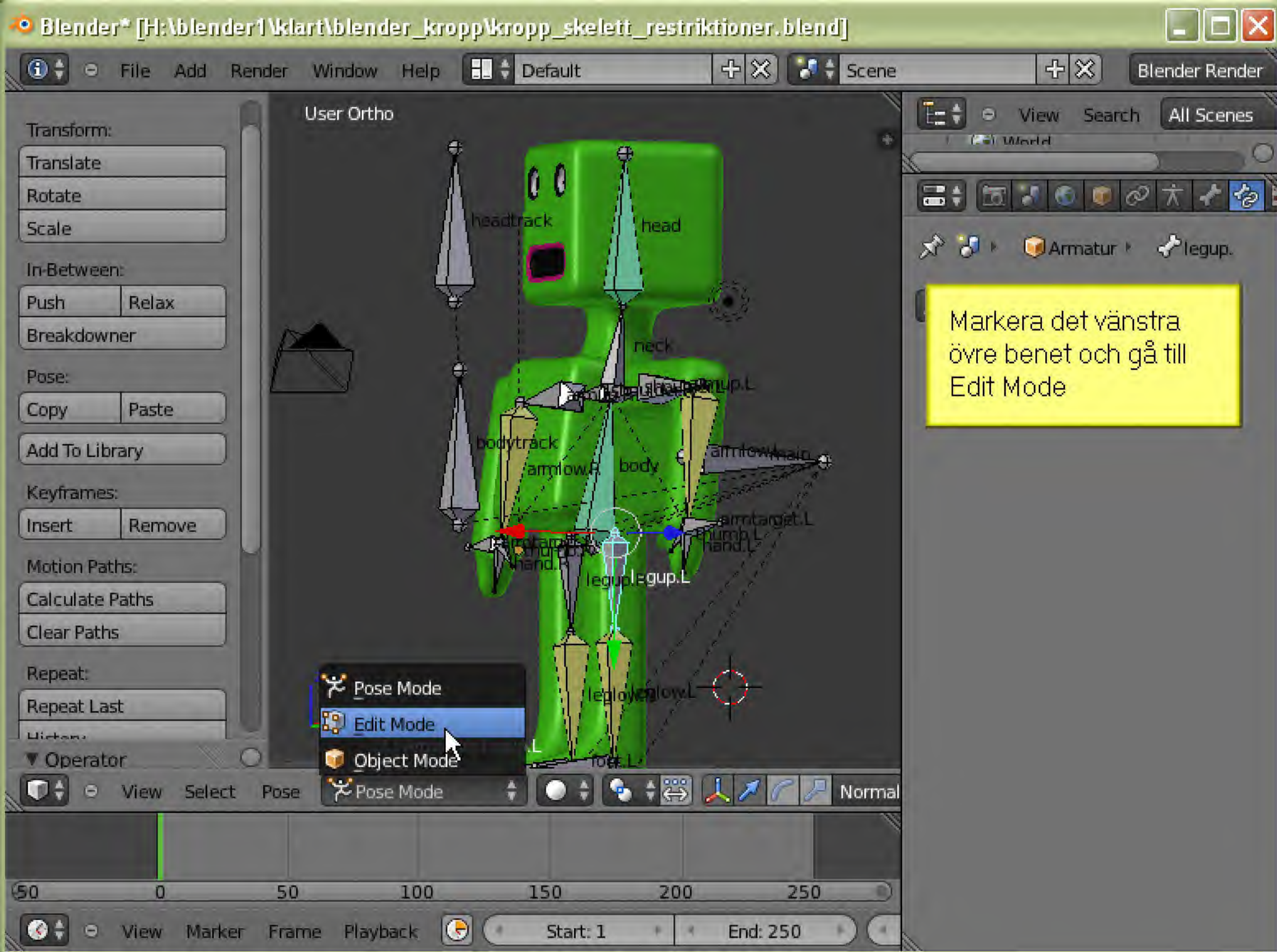


För att göra en walk-cycle behöver man böja på figurens knän. Tyvärr visar det sig att knäna kan böjas åt fel håll.

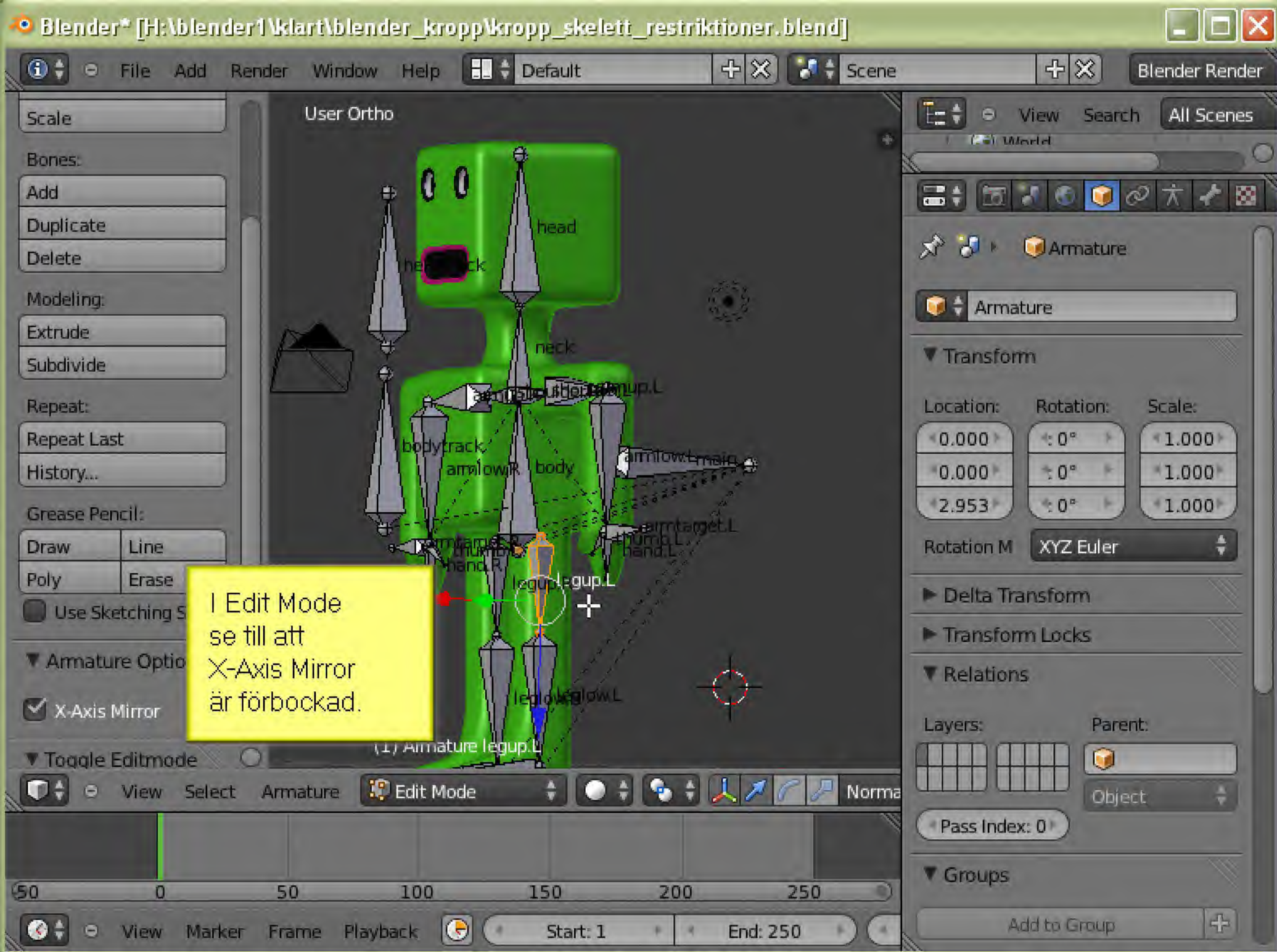




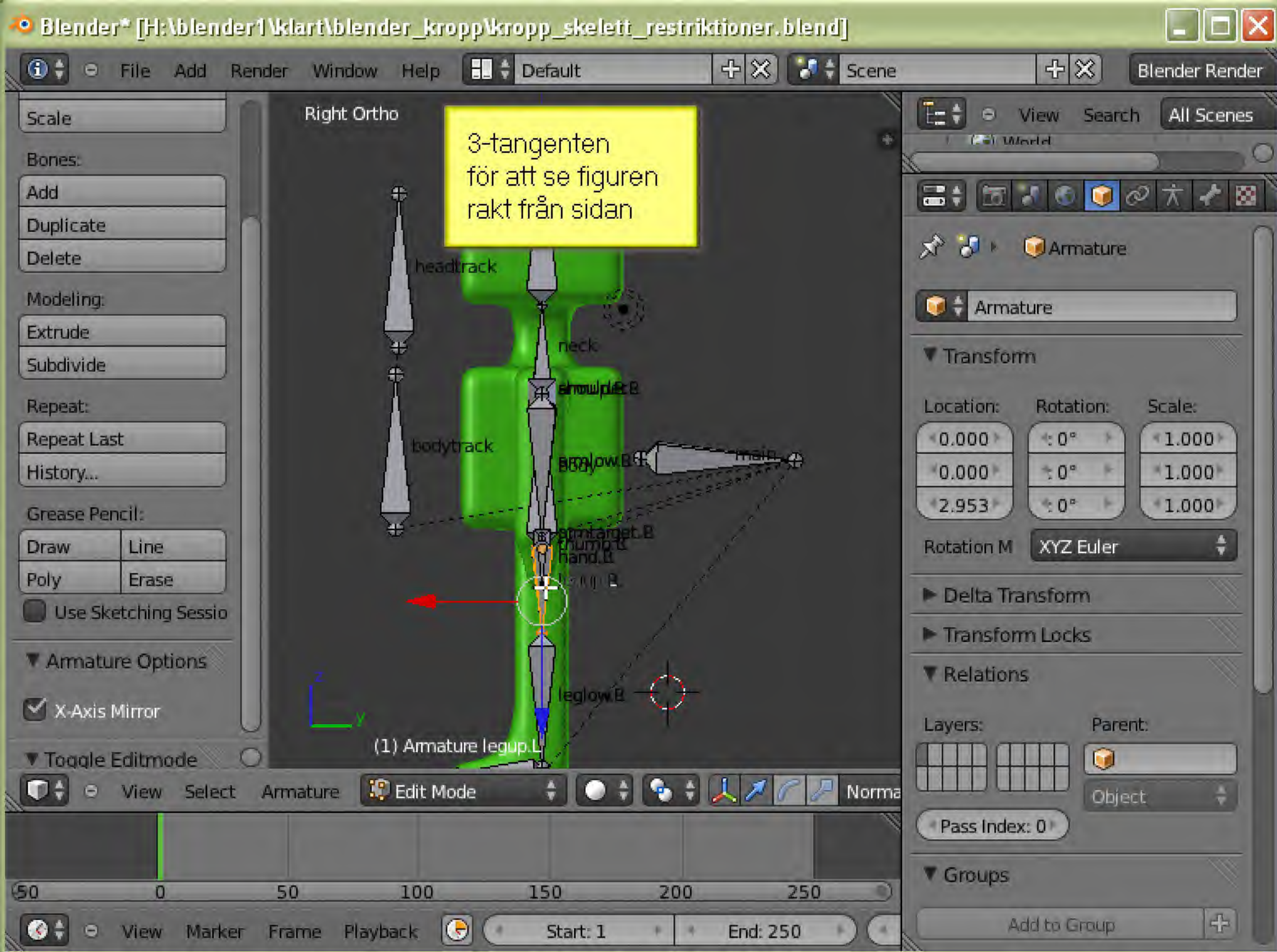




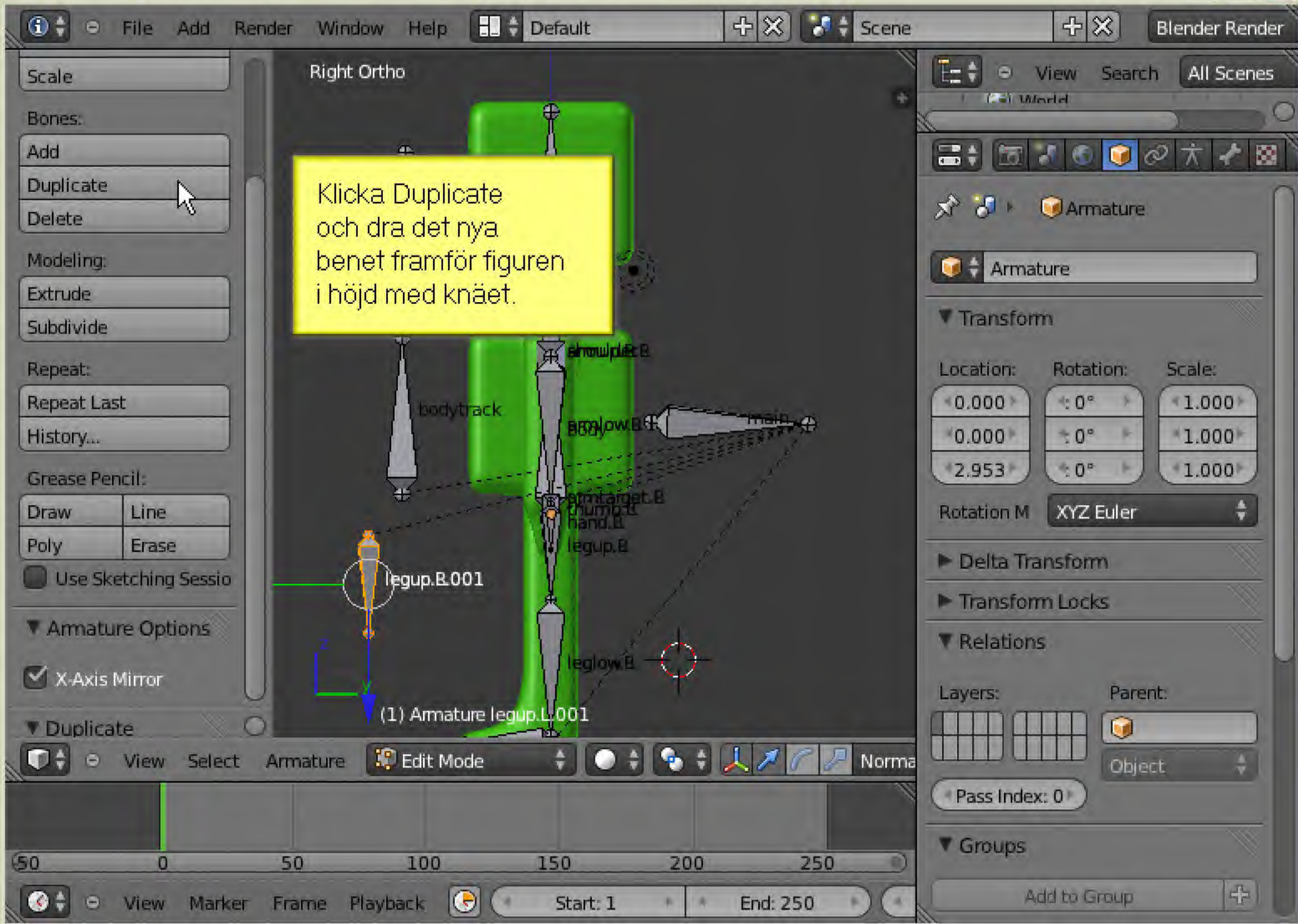




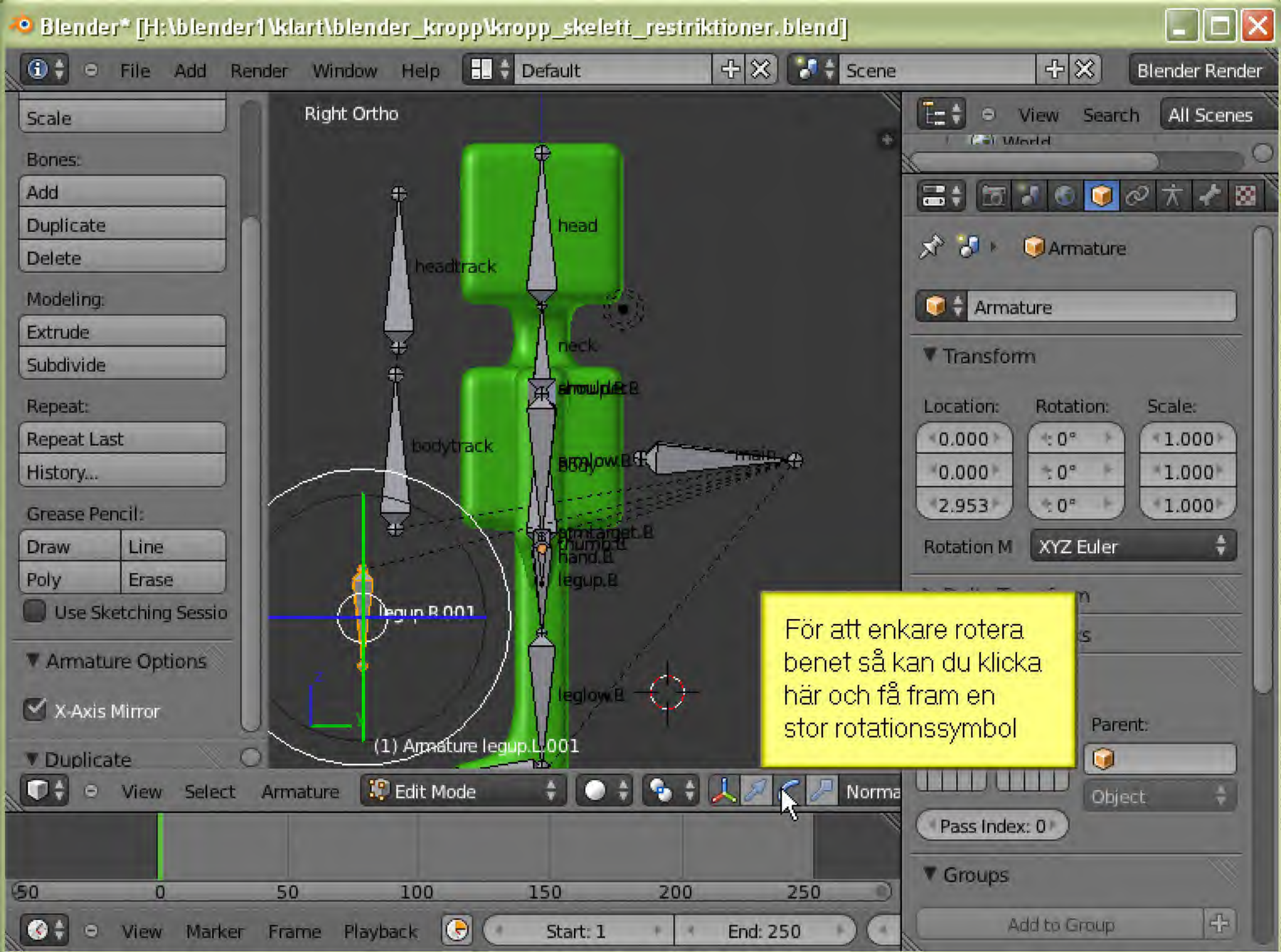






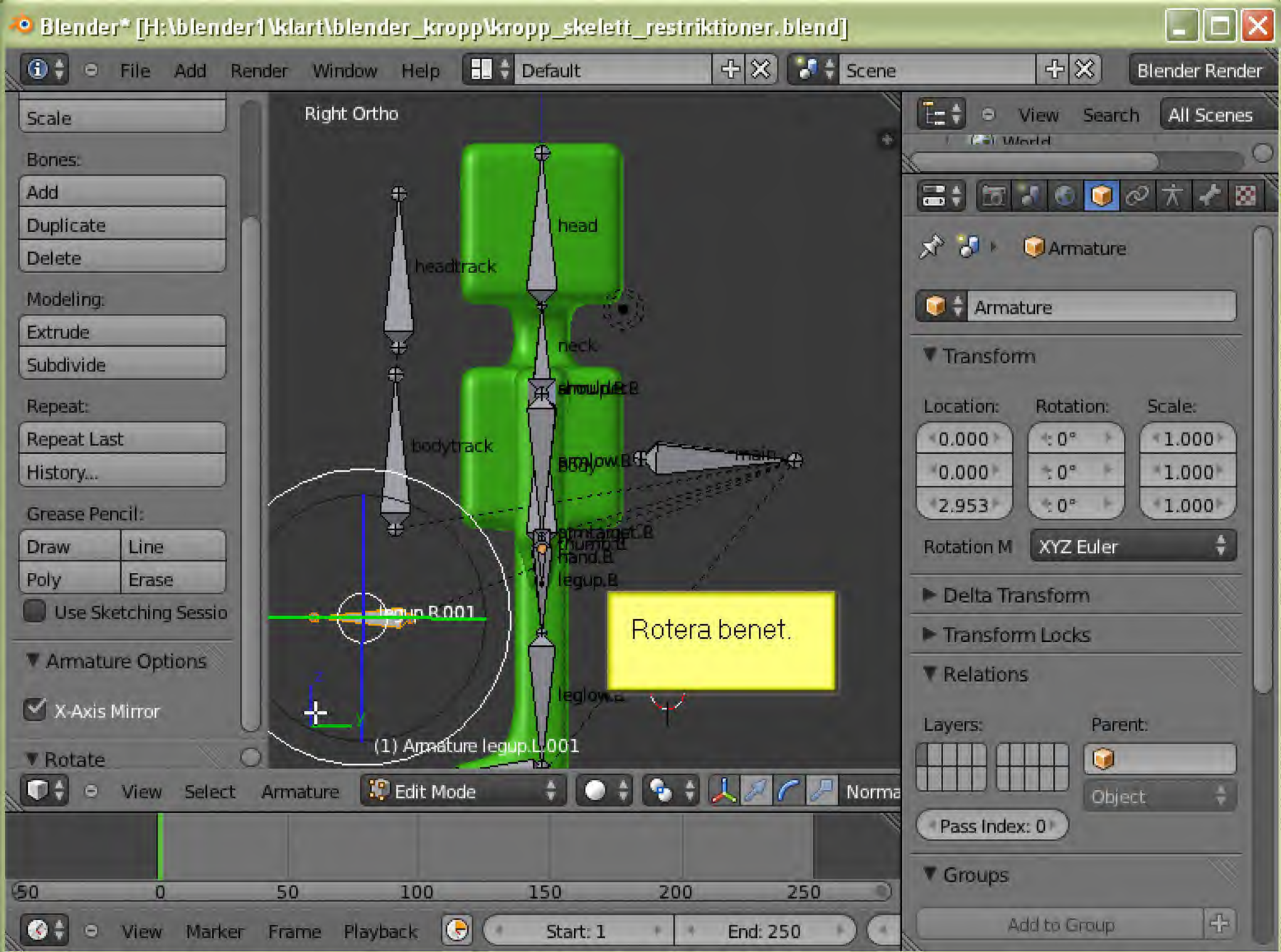






För att enklare rotera benet så kan du klicka här och få fram en stor rotationssymbol





Scale

Bones:  
Add  
Duplicate  
Delete

Modeling:  
Extrude  
Subdivide

Repeat:  
Repeat Last  
History...

Grease Pencil:  
Draw Line  
Poly Erase

Use Sketching Session

Armature Options

X-Axis Mirror

Rotate

View Select Armature Edit Mode

50 0 50 100 150 200 250

View Marker Frame Playback Start: 1 End: 250

View Search All Scenes

Armature

Armature

Transform

Location:	Rotation:	Scale:
<0.000>	<0°>	<1.000>
<0.000>	<0°>	<1.000>
<2.953>	<0°>	<1.000>

Rotation M XYZ Euler

Delta Transform

Transform Locks

Relations

Layers:	Parent:
	Object

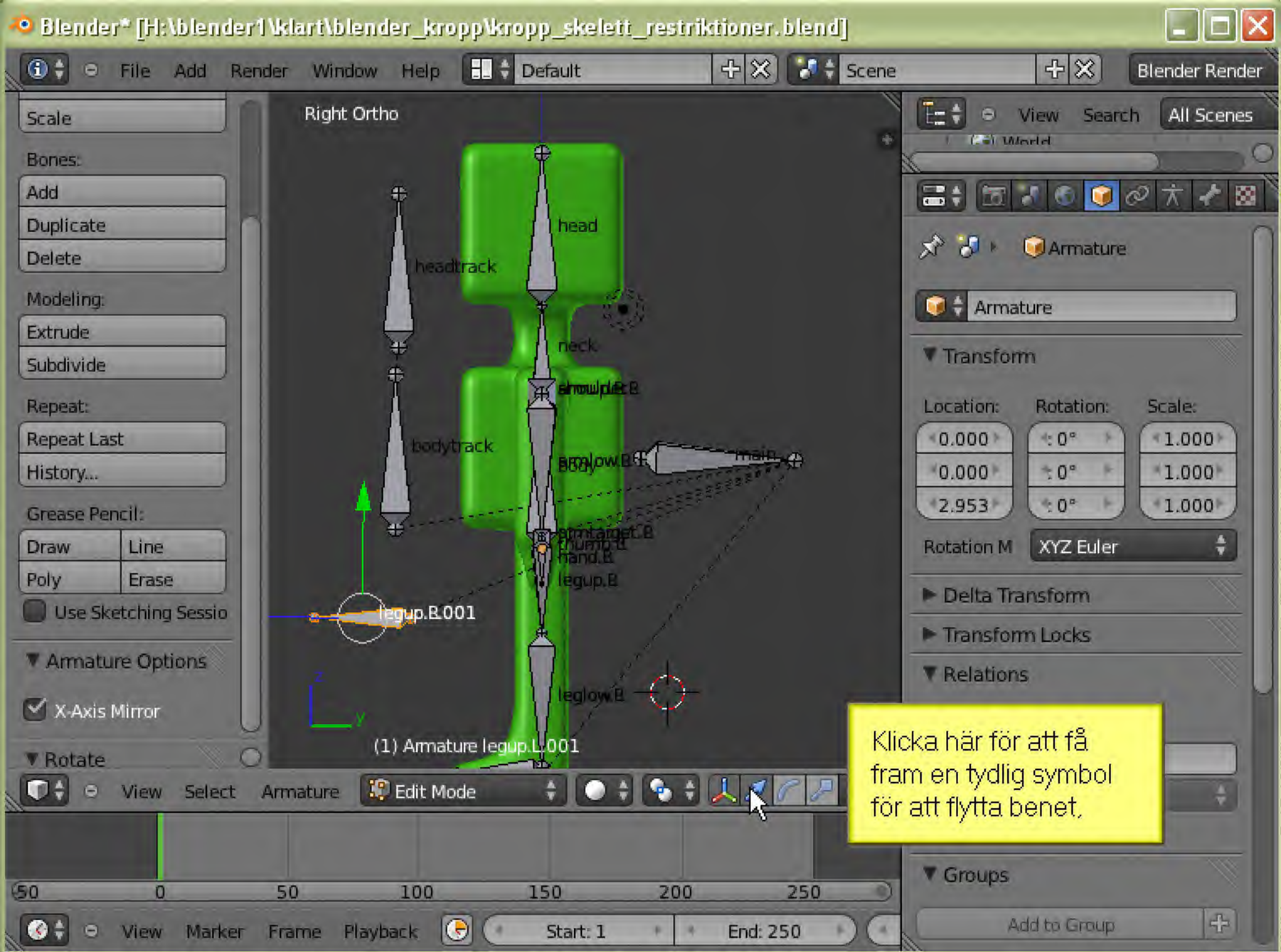
Pass Index: 0

Groups

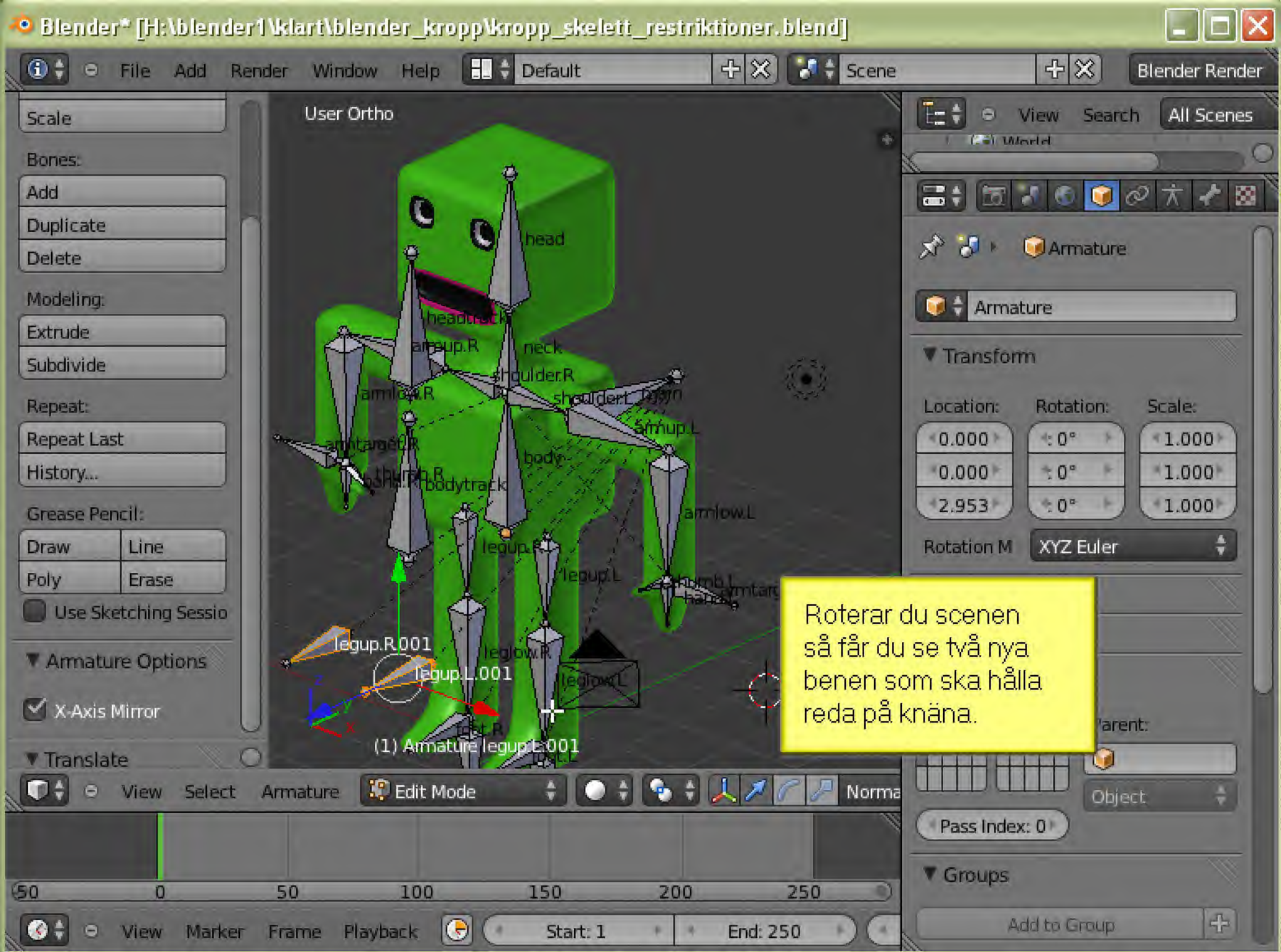
Add to Group

Roterä benet.



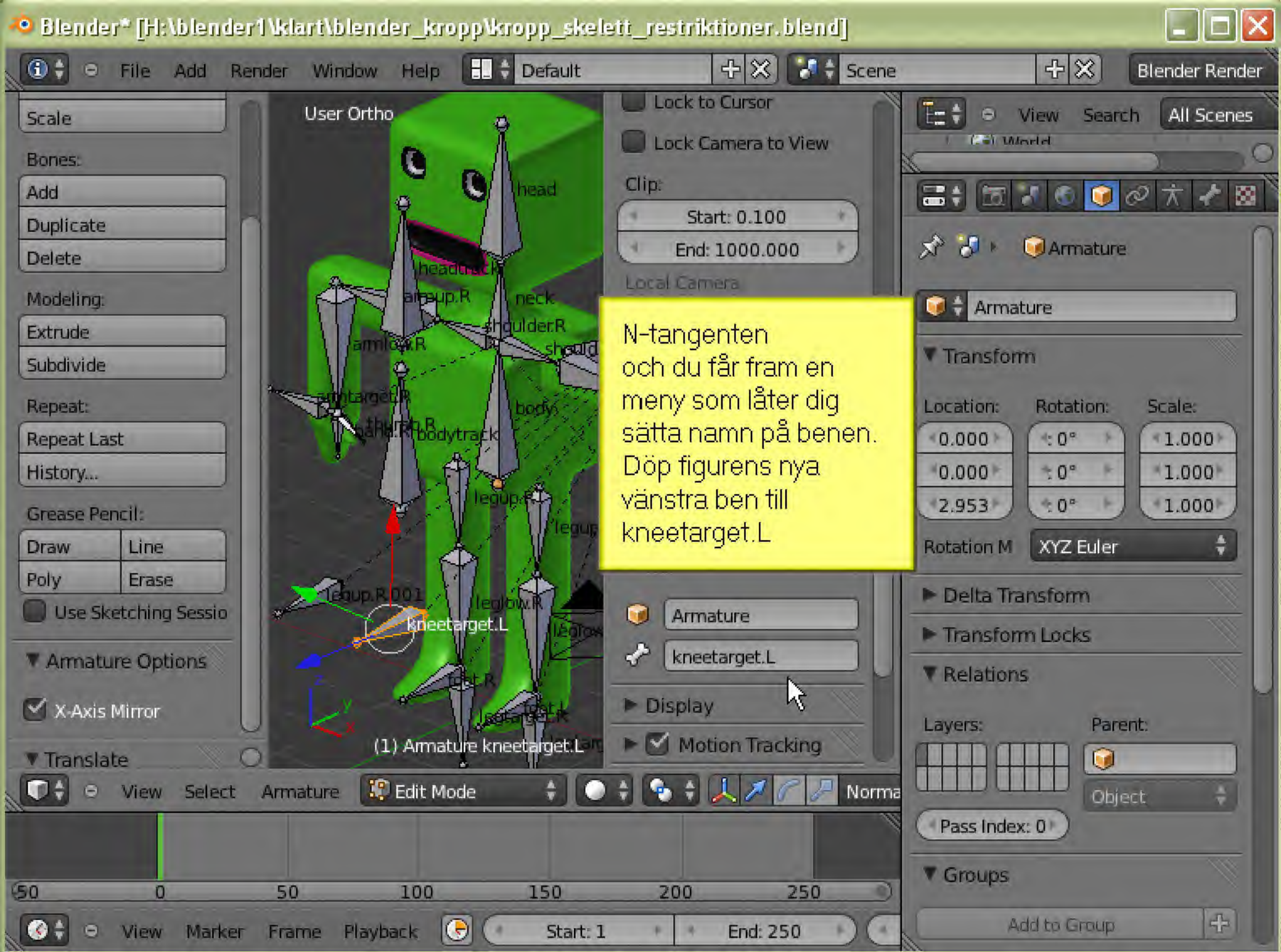






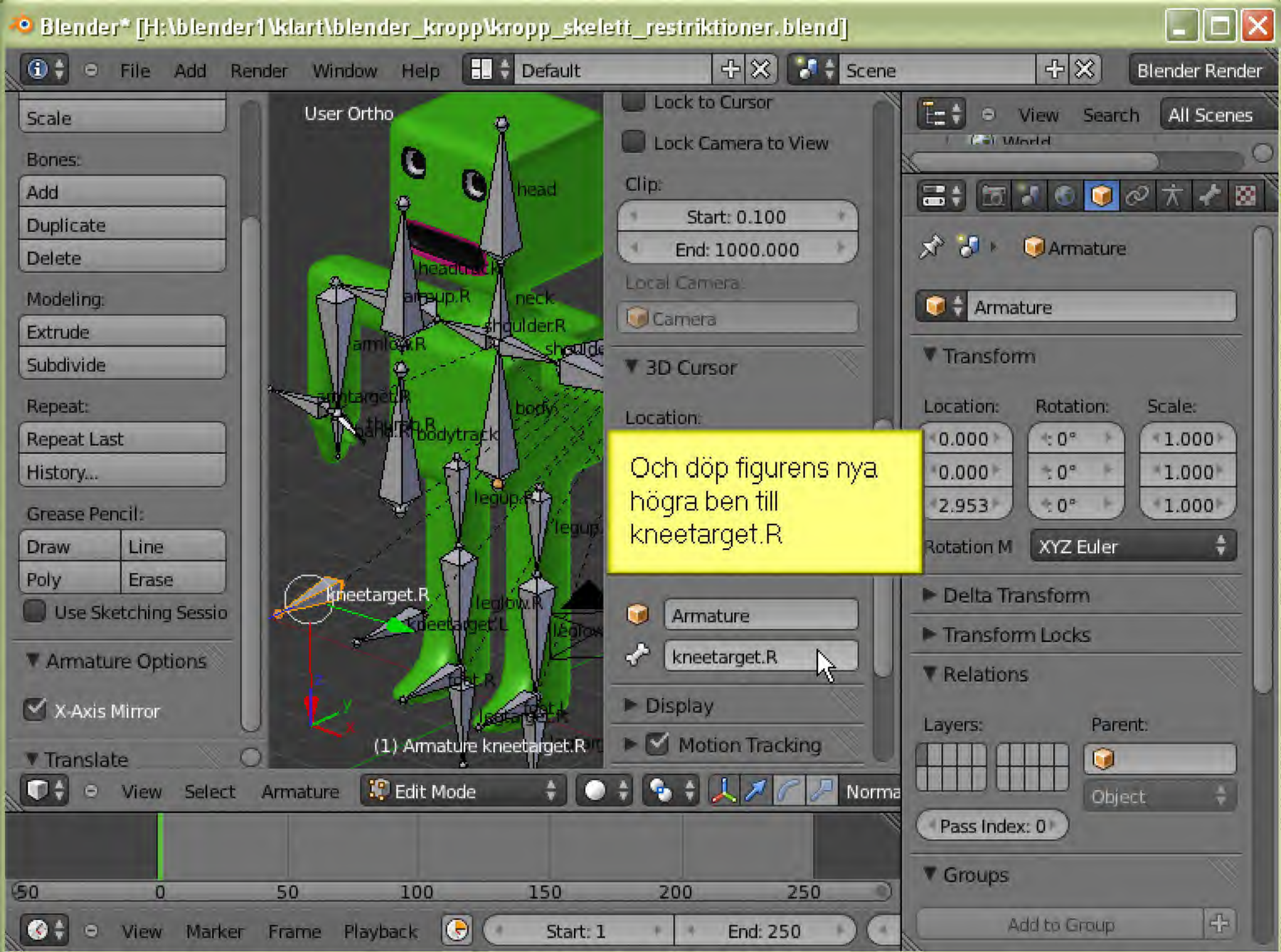
Roterar du scenen så får du se två nya benen som ska hålla reda på knäna.





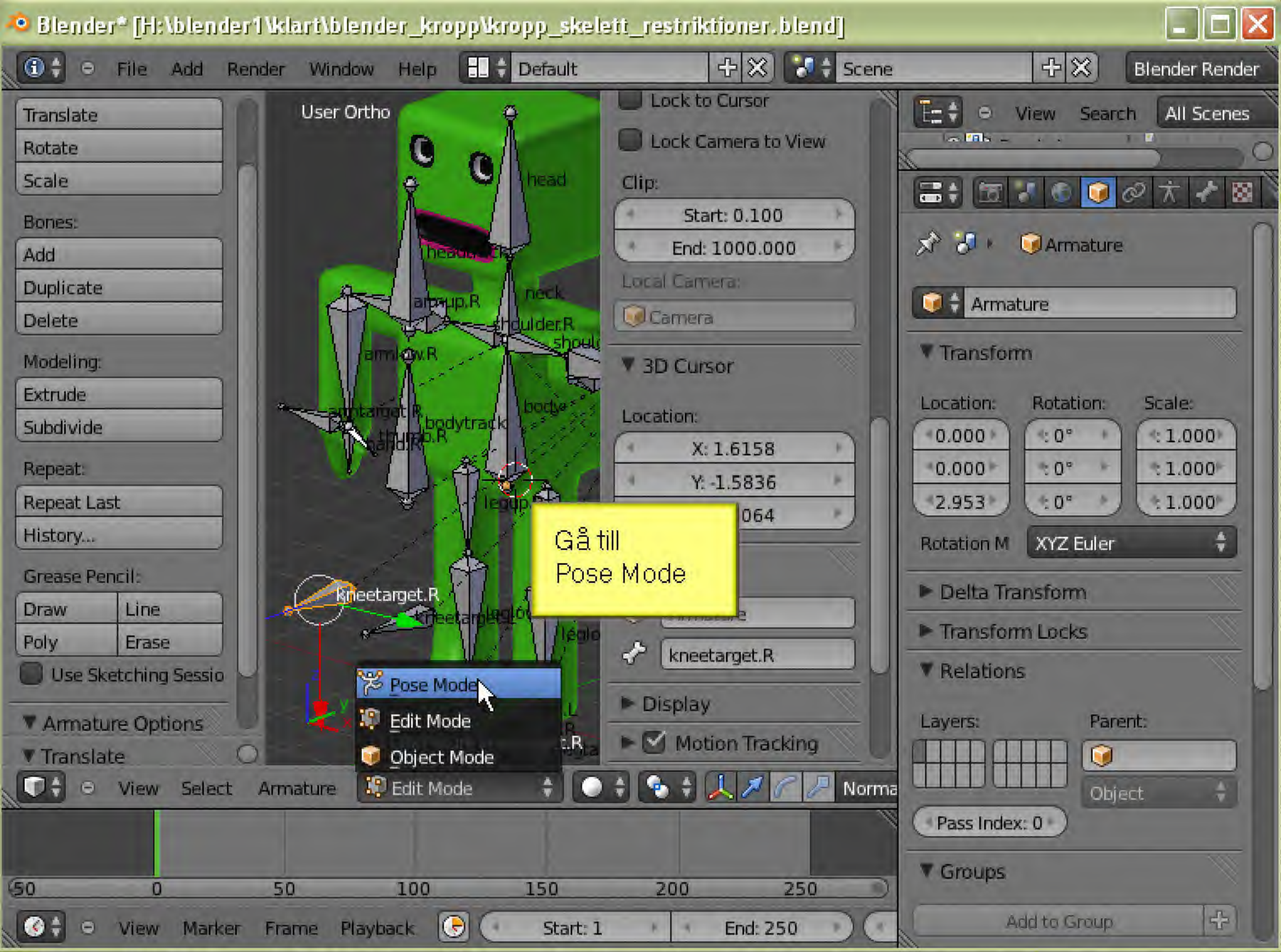
N-tangenten  
och du får fram en  
meny som låter dig  
sätta namn på benen.  
Döp figurens nya  
vänstra ben till  
kneetarget.L





Och döp figurens nya  
högra ben till  
kneetarget.R











File Add Render Window Help Default Scene Blender Render

Translate Rotate Scale In-Between: Push Relax Breakdowner

User Ortho

head neck

Lock to Cursor Lock Camera to View

Clip: Start: 0.100 End: 1000.000

View Search All Scenes

Armatur legup.

Add Constraint

Motion Tracking Transform Tracking Relationship

Camera Solver Object Solver Follow Track

Copy Location Copy Rotation Copy Scale Copy Transforms Limit Distance Limit Location Limit Rotation Limit Scale Maintain Volume Transformation

Clamp To Damped Track Inverse Kinematics Locked Spline I Stretch To Track To

Action Child Of Floor Rigid Body Joint Script Shrinkwrap

Add a constraint to the active bone Python: bpy.ops.pose.constraint\_add(type)

Grease Pencil

Toggle Pose Mode (1) Armature legup.L

View Select Pose Pose Mode

Normal

50 0 50 100 150 200 250

View Marker Frame Playback Start: 1 End: 250

Sen Add Constraint och välj Inverse Kinematics



Blender 2.79 interface showing a 3D model of a green alien character in Pose Mode. The character has a skeletal rig with bones labeled: head, headtrack, neck, shoulderR, shoulderL, armup.R, armup.L, armtarget.R, armtarget.L, thumb.R, thumb.L, legup.R, legup.L, kneetarget.R, kneetarget.L, foot.R, foot.L, legio, and leglo.

The left sidebar contains various tools and settings:

- Translate, Rotate, Scale
- In-Between: Push, Relax, Breakdowner
- Pose: Copy, Paste, Add To Library
- Keyframes: Insert, Remove
- Motion Paths: Calculate Paths, Clear Paths
- Repeat: Repeat Last, History...
- Grease Pencil: Add Constraint

The top status bar shows: View, Select, Pose, Pose Mode, Normal.

The right sidebar shows the 'Add Constraint' panel with the following settings:

- IK (selected)
- Target: Armature
- Bone: [empty]
- Pole Target: [empty]

A yellow tooltip box displays the text: "Välj Target: Armature Bone: kneetarget.L".

The bottom status bar shows: View, Marker, Frame, Playback, Start: 1, End: 250.



Normal

End: 250

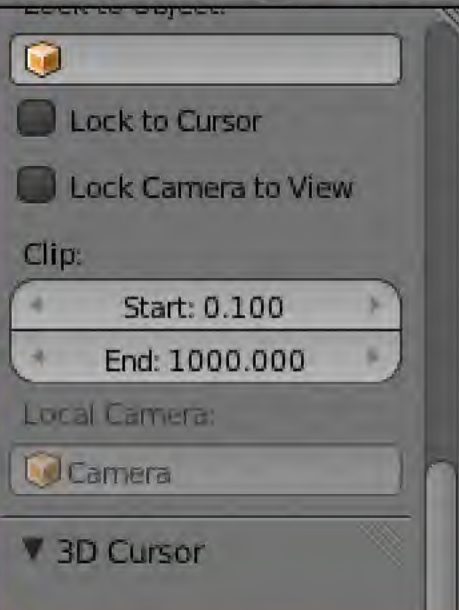
► **Nicklas**

Influence: 1,000

100

Influence: 1,000





► Nicklaus



File Add Render Window Help Default Scene Blender Render

Translate Rotate Scale

In-Between: Push Relax Breakdowner

User Ortho

head neck

Lock to Cursor Lock Camera to View

Clip: Start: 0.100 End: 1000.000

View Search All Scenes

Armatur legup.

Add Constraint

Motion Tracking Transform Tracking Relationship

Camera Solver Object Solver Follow Track

Copy Location Copy Rotation Copy Scale Copy Transforms Limit Distance Limit Location Limit Rotation Limit Scale Maintain Volume Transformation

Clamp To Damped Track Inverse Kinematics Locked Spline I Stretch To Track To

Action Child Of Floor Rigid Body Joint Script Shrinkwrap

Add a constraint to the active b Python: bpy.ops.pose.constraint\_add(t

Och Add Constraint och välj Inverse Kinematics

Grease Pencil

Add Constraint

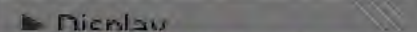
(1) Armature legup.R

Normal

50 0 50 100 150 200 250

View Marker Frame Playback Start: 1 End: 250





Influence: 1.000



Normal

\_\_\_\_\_

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När du nu försöker böja på knät så funkar det mycket bättre.



